A2200-2

PROFILE OF MEDICAL PRACTICE 1980

Decade of the 1970s — The Changing Profile of Medical Practice

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Center for Health Services Research and Development
AMERICAN MEDICAL ASSOCIATION

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Additional copies of this book
may be purchased from:
Order Department OP 011
American Medical Association
P.O. Box 821
Monroe, WI 53566

ISBN: 0-89970-018-7
ISSN: 0194-2921

LAB: 80-264:3.5M:6/80

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Foreword

Profile of Medical Practice, and, its companion volume Socioeconomic Issues of Health, may serve as valuable resources to readers interested in health care issues. Profile contains current data describing the physicians' services sector of the United States health care system, and articles analyzing social, economic, and policy issues relevant to health care in the U. S.

The ninth annual edition of Profile, subtitled "The Decade of the 1970s—The Changing Profile of Medical Practice," focuses on trends and changes observed in the health care system during the recent decade. Statistics in this volume are derived principally from the AMA Center for Health Services Research and Development's Thirteenth Periodic Survey of Physicians (PSP). Data from this ongoing survey facilitate comparisons, over time, of key characteristics of medical practice. Extensive efforts are undertaken to assure the accuracy and reliability of the statistical tabulations presented in this volume.

This year, the selection of articles in Profile attempts to provide a survey of important issues and changes during the past decade, and to suggest potential profiles of medical practice for the 1980s. The introductory article, "Decade of the 1970s - Window on the 1980s," reviews major legislative, regulatory, and government initiatives in health care and integrates these developments with relevant summary statistics. Other articles focus on specific topics and trends in the economics, demographics, and administration of physicians' and other health care services.

Profile includes contributions from within the AMA Center for Health Services Research and Development and from individuals in the health services research community. These papers are offered to provide readers with a variety of perspectives and do not necessarily reflect AMA policy.

We in the Center for Health Services Research and Development hope that all readers interested in the United States health care system will find this volume to be a useful contribution to the literature.

Lynn E. Jensen, Director
Center for Health Services
Research and Development
American Medical Association

Acknowledgements

The editors express sincere appreciation to the following persons for their help in preparation of Profile of Medical Practice 1980: Joel D. Bobula for supervising construction of the data file with the assistance of Monica Teutsch; Helen Enos for compiling the index; Pat Kelps and Virgie Vikara for typing the manuscript; Arsenio Oloroso for coordinating production of Profile; Anita L. King for assuring that the entire process ran smoothly; and Andrea Powell for assisting. The editors also wish to thank Edward Meeker, Lynn E. Jensen, and Ralph Linnenburger and the staff of AMA's Department of Creative Services.

Note to Prospective Authors

Profile of Medical Practice publishes research papers relating to the economics of medical practice. Authors who wish to submit an article to be considered for inclusion in the tenth edition of Profile of Medical Practice should send a brief abstract no later than October 1, 1980 to:

Editor
Profile of Medical Practice
Department of Economic Research
Center for Health Services Research
 and Development
American Medical Association
535 North Dearborn Street
Chicago, Illinois 60610

The editor will respond to the abstract by sending a copy of the style manual. Three (3) complete copies of the paper must be sent to the above address by December 31, 1980.

Manuscripts will be submitted to referees and the author will be informed of their decision shortly after receipt of the paper.

Part I—Introduction
“Decade of the 1970s—Window on the 1980s”

Decade of the 1970s — Window on the 1980s: a Review of Health Care Policy *by Randolph B. Fenninger and Edward F. Meeker**

INTRODUCTION

The beginning of a new decade is considered a good time for taking stock, for looking at where we have been, where we are, and where we might be going. Even though events and trends pay little attention to the calendar, the change from an old decade to a new one is a human milestone and a convenient and important point for assessment. Thus, it is a good time to look at the status of the United States health care system and especially to examine the relationship between the federal government and the health care industry. For if any one factor will influence health care in the 1980s, it is the government.

During the 1970s, the relationship between health care and the federal government grew increasingly complex. Once generous, Uncle Sam became tight fisted and demanded a larger role in activities previously the exclusive province of medical practitioners. The role of government in health care is, however, by no means settled. It is safe to predict that the 1980s will see a continuation and expansion of government involvement. Just how the federal government's role will develop cannot be predicted with complete accuracy, but the activities of the 1970s give many clues that enable us to draw general conclusions about what the future holds.

The purpose of this article is to look at government's and the health care sector's relationship in the decade just past and to suggest a scenario for the decade just begun. But if we are to understand the 1970s, we must first take a short look at the preceding decade, for the decisions made by the federal government in the 1960s are largely responsible for its actions taken in the 1970s.

THE 1960s - A DECADE OF EXPANDED ACCESS TO HEALTH CARE

The ultimate purpose of the health care system is to provide health care services to individuals who need and want them. This requires a proper mix of three elements: facilities and equipment; personnel to use these facilities and equipment and to provide the care; and finally, a means for financing the delivery of the needed services. By the mid-1960s the federal government was committed to expanding all three elements with the goal of assuring that every individual had access to health care. Although the goal of ensuring access has not been completely achieved, there is no question that the decisions made in the 1960s (and in some cases, even earlier) succeeded in significantly expanding all three elements. In fact, as we shall see, this very success became the foundation for the government's decisions to expand its health care regulatory activities during the 1970s.

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Expansion of Health Care Facilities

In 1946, the U. S. Congress began to subsidize the building and renovating of community hospitals. The adoption of the Hill-Burton Act, which made federal funds available for hospital construction and improvement, was the first significant action aimed at affecting the level and composition of factors used in the delivery of health care.

During the life of the Hill-Burton Program, 1947 to 1974, in excess of $4.1 billion was granted for hospital construction and improvement; another $1 billion was used in loan and loan-guarantee programs. State and local sources supplied an additional $10.4 billion to these projects. In all, over 6,500 hospitals, representing approximately 436,000 beds, were either built or improved under this program. Federal Hill-Burton grant monies represented 28 percent of the total spent on construction and improvements during this period. (Cambridge Research Institute 1976).

The Hill-Burton Program was undertaken to address a shortage of hospital beds which resulted from the decline in construction during the Great Depression and World War II. It was also designed to correct interstate disparities in the number of hospital beds per 1,000 population. By the mid-1970s the shortage was generally eliminated, and some areas were said to have surplus beds. The number of beds per 1,000 population increased from 3.3 in 1950 to 4.4 in 1975. Further, by 1975 the interstate difference in beds per 1,000 population had substantially narrowed.

Shortly after World War II, the decision to use federal funds to support biomedical research further encouraged the growth of facilities. In 1947, federal dollars made up approximately 30 percent of the nation's total expenditures for medical research. By 1977, the federal government contributed approximately 65 cents of each research dollar (Strickland 1978). Government spending for health research has grown from $117 million in 1950 to $4.3 billion in 1978 (Gibson 1979). The National Institutes of Health (NIH) became an important source of public monies to be tapped by individuals and institutions. These funds supported manifold medical advances. In addition, these federal funds directly or indirectly helped to finance new buildings to house research activities, new clinics, and laboratory facilities. The existence of these federal funds also meant that other sources of money could be used for hospital facilities expansion instead of for biomedical research.

Expansion of Health Care Personnel

Congress realized that without sufficient physicians, nurses, and other health personnel to staff them, all the clinics, hospitals, and research facilities would be of little use to the public. In 1963, Congress began consideration of legislation to provide direct federal financial assistance for the education of health professionals. Congress specifically noted that these funding mechanisms were needed to increase the supply of health professionals serving the public. The Congress thus passed the Health Professions Educational Assistance Act of 1963, authorizing grants for the construction and expansion of medical and other health professions schools. In addition, loans were made available for medical students to assist in financing the cost of medical education and, in particular, to encourage those who otherwise could not afford such education to seek medical training.

The decisions made in 1963 by the Congress set the tone for the future involvement of the federal government in medical education and in the training of other health professionals. Succeeding pieces of legislation would include funds for the construction of educational institutions, funds to assist students in health professions training, and funds to encourage special projects which were deemed of particular interest to the nation.

By 1965, it was clear to Congress that far more needed to be done to correct what was then perceived as a major shortage of health manpower. That year, Congress passed another law expanding federal support for health professions education which was designed to encourage expanded enrollments in health professions schools and also to deal with the financial problems being experienced by a number of these schools.

In 1968, Congress again reviewed health manpower legislation and made the commitment to further expand federal support for health professions education. The concerns about shortages of health professionals still prevailed and Congress agreed, in the adoption of the Health Manpower Act of 1968, that additional health professionals, especially physicians, had to be produced as fast as the educational system could train them.

These policies had a significant impact on the number of medical schools, their sizes, and the number of physicians. In 1965, there were 88 medical schools; by 1979 the count stood at 125. United States medical schools graduated 7,081 students in 1960, 7,409 in 1965, and 14,966 in 1979 (American Medical Association 1980). The number of non-federal, patient-care physicians per 100,000 population grew from 122 in 1969 to 148 in 1978. (See Table 12 in Part IV of this volume.)

Expansion of Financing Mechanisms

By 1960, about 70 percent of the population had some insurance for hospitalization, and over 60 percent had some coverage for surgery. This coverage was often part of work-related "fringe benefits." However, large segments of the population, especially the poor and the elderly, had no coverage or grossly inadequate coverage. For them, the financial burdens of obtaining medical care, or any other service, were especially acute.

In 1965, the Congress enacted the Medicare and Medicaid programs. In so doing, the federal government made a financial commitment to persons over age 65 and the poor. By this action, lack of personal funds would not prohibit these individuals from obtaining health care. The decision that government should act as the insurer of last resort completed the triad of elements necessary to assure the availability of, and access to, care. This financial commitment, however, has grown geometrically in the years since it was first undertaken. Also, by involving the federal government in the small and tedious decisions of reimbursement, it opened the door to the government as a regulator of the medical marketplace.

The availability of health insurance to other segments of the economy increased dramatically concomitantly with the decision by Congress that government should subsidize insurance for the poor and aged. Increasingly, labor union negotiators demanded first-dollar coverage for the health needs of employees and their families. Tax laws permit the employer to write off the cost of health insurance. Also, employees escape any tax liability for the employer's contributions. Both sides are encouraged, therefore, to negotiate for ever larger health benefits in total and as a proportion of total compensation.

By 1977, 78 percent of the population (80 percent of those under 65) had private hospital insurance and 76 percent (80 percent of those under 65) had private surgical coverage. The proportion of consumer expenditures for personal health care met by insurance rose from 35 percent in 1950 to 67 percent in 1978 (Gibson 1979).

THE 1970s - LEARNING TO LIVE WITH THE SUCCESSES OF THE 1960s

The success of these early decisions to expand the system is clear today; more facilities serve more people with more services than were ever imagined at the end of World War II. The number of health professionals increased far more rapidly than the growth of the general population. Utilization of health services by the elderly and/or poor Medicare-Medicaid population now compares favorably with the rest of society. Americans are living longer; mortality rates are lower than ever before.

While all observers agree that these programs to expand facilities, personnel, and financing generated significant benefits, there is also agreement that the success of these programs has invariably been accompanied by significant increases in expenditures for health care. In 1950, total U. S. spending for health care equaled $12.7 billion or 4.5 percent of Gross National Product (GNP). By 1978, the country's health care spending totaled $192.4 billion or 9.1 percent of GNP. Federal outlays for personal health care expenditures grew from $1.1 billion in 1950 (2.6 percent of the federal budget outlays), to $3.8 billion in 1965 (3.3 percent of the federal budget outlays) to $46.5 billion (10.3 percent of the federal budget outlays) in 1978 (Gibson 1979; U.S. Bureau of the Census 1979).

Thus, it is not surprising that during the 1970s some policy makers began to wonder whether the "successes" of the U.S. health policy might, in fact, be "excesses."

The growth of private insurance and the entrance of the federal government into the insurance market for health care meant that more money was available to pay the costs of providing this care. Third-party reimbursement allowed patients, physicians, and institutions to demand and use more medical care services because patients were increasingly insulated from the cost of these services and providers were more assured of payment for services rendered. The diminution of financial incentives for cost-effective use of health care, and the adequate, or, according to some, surplus supplies of facilities and personnel are the major causes of spiraling health care costs, according to many analysts. This conclusion led to the political judgment of the 1970s that health care is overly expensive and requires government regulation to keep expenditures within reasonable limits.

Thus, during the 1970s, health policy makers increasingly focused on the issue of cost containment. The federal government, in particular, sought to contain the costs of its Medicare and Medicaid programs. Thus, the 1970s represented a paradox, witnessing the introduction of several National Health Insurance (NHI) bills, concomitant with the introduction of regulatory programs such as Professional Standards Review Organizations, Health Systems Agencies, Certificate-of-Need, and the Carter Administration's Hospital Cost Containment Act. As described below, many of the initiatives of the 1960s were either severely curtailed or modified in order to contain costs during the 1970s.

Reexamining the Issue of Health Care Facilities

The 1960s were characterized by government efforts to increase the supply of health care facilities, particularly hospitals. By the 1970s, however, Congress had become convinced that the growth of health care facilities should be directly controlled. An early and controversial step was the enactment in 1974 of the National Health Planning and Resources Development Act (P.L. 93-641). The purpose of this progam was to control expansion in the institutional sector of the health care industry and to devise a mechanism of local, state, and national planning that would monitor the allocation of health care resources. Policy makers believed that the health planning system could end the creation of duplicative institutional health services, eliminate unnecessary hospital beds, and in short, put a closer regulatory rein on the industry.

The Planning Act served, in part, as the catalyst for establishment of Certificate-of-Need (CON) legislation at the state level. In states with CON laws, institutions desiring to make capital improvements (build new hospitals or expand old ones, improve facilities, purchase certain capital equipment, etc.), must obtain certification of need from the planning authority. Proponents of planning argue that the process should slow the expansion of facilities and, thus, reduce the growth of spending on health care services. Those opposed to CON argue that it results in additional red tape, reduces competition among institutions, may lead to long-term deterioration of existing facilities, and may result in a less than optimal allocation of resources to areas outside of CON authority.

The impact on health care costs of the Planning Act is difficult to evaluate because of the relatively brief experience with the program. However, the evidence based on experience to date indicates that planning has not reduced hospital investment. Instead, the nature of hospital investment has changed (Salkever and Bice 1976; Wendling 1978). For example, in areas where CON strictly limits additional bed capacity, hospitals have channeled their expenditures into other areas, such as staff, and equipment which is excluded from CON review. The aggregate amount of investment, however, does not appear to be markedly reduced.

At the time Congress enacted the health planning law it also substantially revised the Hill-Burton hospital construction program creating a new resources development authority which would be closely linked to the health planning concept. Furthermore, Congress has opted not to appropriate substantial funds for hospital construction under this new act.

Reexamining the Issue of Health Care Personnel

In addition to attempts to limit the growth of health care facilities in the 1970s, policy makers also examined the issues related to the supply and types of health care personnel. In general, Congress sought to limit the expansion of the number of health care personnel.

Physicians

In 1976, after two years of debate, Congress adopted a new Health Professions Educational Assistance Act (P.L. 94-484), which officially declared that there was no longer a shortage of physicians. The legislation took steps toward regulating both the numbers and the types of physicians produced in the nation, specified percentages of residency spaces which were to be devoted to primary care, reduced funds available for institutional support, increased funds for support of physician assistants, and severely restricted the influx of foreign medical graduates. These Congressional actions represented an effort to slow expansion of the physician population, an expansion which was directly attributable to Congessional decisions in 1963, 1965, and 1968. While Congress also took steps to influence the distribution of physicians by specialty and geographic location of practice, the goals set for the creation of additional primary care practitioners had already been exceeded by private sector efforts before the new law went into effect in 1976.

The 1976 Health Professions Educational Assistance Act also modified policies concerning foreign educated immigrant physicians.

The new policies made it more difficult for these physicians to come to the United States, both for graduate medical training or for permanent residence. However, in the interest of medical care continuity and foreign relations, within a year of adopting these changes, Congress was persuaded to make modifications. These modifications eliminated some of the more radical aspects of the law adopted in 1976. However, in the judgment of many observers, much remains to be done to ensure that the medical education network in the United States, especially the graduate training system, is made available to physicians from other countries.

Allied Health Personnel

Although overall health care policy in the 1970s stressed a reduction in the rate of increase of medical personnel, the government sought to encourage the growth of certain categories of allied health personnel. A unique aspect of the government's efforts to live with the success (or excess) of decisions made ten or more years earlier was its support for the training and reimbursement of non-physician health providers, such as physician assistants and nurse practitioners. Underlying this effort was the belief that the government should try to find less expensive substitutes for physicians.

In 1978, Congress adopted a new mechanism to finance clinics in rural areas creating a test case for this concept. In these remote clinics, health personnel such as physician assistants and nurse practitioners may now receive Medicare and Medicaid reimbursement independent of a physician. This program raised substantial concern within the medical community about the relationship between the relatively independent allied health personnel and the clinic's supervisory physicians who remain ethically and legally responsible for them. However, this effort can be expected to continue. In addition to this reimbursement strategy, the federal government through its health manpower legislation has for some time encouraged the training of increased numbers of physician assistants and nurse practitioners. It can be expected that this trend will continue into the decade of the 1980s if there is sufficient public acceptance of the care provided by these types of practitioners, and if the perceived geographic and specialty maldistribution of physicians continues.

Reexamining the Issue of Financing Mechanisms

By the early 1970s, the United States government found that its investment in Medicare and Medicaid far exceeded the totals projected in 1965 and 1966. The increasing drain on the federal budget by these two programs and allegations of rampant fraud and abuse led Congress to seek ways to curb rising expenses and alleged misuse. Several monitoring and control mechanisms were initiated, and continue in use today. Furthermore, many modifications in financing mechanisms have been adopted by both public and private third-party payors.

Professional Standards Review Organizations

In 1972, Congress mandated establishment of the Professional Standards Review Organizations (PSROs). These physician-run peer review bodies were intended to monitor the quality, necessity, and appropriateness of the care being provided under Medicare and Medicaid. Senator Wallace F. Bennett, the author of the PSRO amendment, asserted that the taxpayers were entitled to know whether their money was well spent. Congress charged the PSRO program with the duty and function of monitoring the quality and appropriateness of the care given to individual patients. If the PSRO found the care to be inappropriate or unnecessary, it could rule that federal payment should not be made. For repeated offenses by a physician or facility, the PSRO may apply monetary sanctions or exclude providers and practitioners from Medicare and Medicaid reimbursement.

The PSRO program struggled through several years of underfunding, litigation, indifference, and outright hostility. By the end of 1979, however, approximately 187 of the 195 geographically defined PSRO areas in the nation were conducting some concurrent hospital review. However, seven and one-half years after the program was mandated, struggles over quality assurance versus cost-containment objectives for PSROs remain unsettled. According to some involved in the program's enactment in the early 1970s, the PSROs' primary duty should be quality assurance. Cost savings would be nice, but were viewed as an accessory.

By the close of the decade, however, with increased political emphasis on health care costs, the federal government began examining the potential for existing programs to reduce the rate of cost increases in the health care sector. Because PSROs could deny reimbursement and because they were already in operation in many areas, the Carter Administration and Congress focused on them. PSROs were expected to control health care expenditures primarily through a reduction in hospital utilization. Official evaluations were conducted and Congressional hearings held, all attempting to determine just how much money PSROs had saved. However, with the data available, little, if any, cost savings could be documented.

The HEW evaluation of the nascent PSRO program's efforts in 1976 failed to reveal aggregate Medicare cost savings attributable to PSRO review. Supporters of the system argued that PSROs were not intended to contain costs and should not be judged on that basis. However, Administration spokesmen and others zealous about cost containment called for a redoubling of efforts to contain costs. In 1978, for example, the Chairman of the House of Representatives, Ways and Means Committee, Subcommittee on Oversight, Sam M. Gibbons stated: "I am concerned that presently PSROs cost more than they save . . . This subcommittee would not agree to permit the PSRO program to continue in its present form unless we can be convinced the program can be run in an efficient cost-effective manner." (See Shapiro 1979.)

The 1978 HEW evaluation of PSRO Medicare hospital review activities in 1977 estimated that PSROs saved $1.10 for each $1.00 spent on this particular PSRO function (Shapiro 1979). Early results of the 1979 evaluation estimated a PSRO-related reduction of 1.7 percent in hospital days reimbursed under the Medicare program in 1978. At the close of the 1970s, the PSRO program was battered but still intact. Whether or not the savings generated by PSROs will be sufficient to satisfy demands of the political process remains to be seen.

In the private sector, third-party payor utilization review programs also attempt to achieve the objectives of assuring the appropriateness and necessity of health care services for which they reimburse. In some areas, these programs closely mirror the PSRO peer review system, while in other cases the insurer relies on a claims review process.

Limiting Expansion of New Medical Technologies

In addition to reviewing the appropriateness and necessity of individual incidences or episodes of health care service delivery, Congress questioned the general appropriateness of new health care technologies. Congress and public program administrators voiced particular concern with whether public coverage should be provided for these new procedures and treatments, and with the effects of this technology dissemination on health care costs. (See Cotterill in Part III of this volume for a review of the literature concerning technology and health care costs.)

Congress concluded that one important cause of increased health care costs is the proliferation of new and often expensive health care technologies. Congress thus initiated a formal mechanism to evaluate and control this growth, generated in part by federal research funds and by cost-based reimbursement. The National Center for Health Care Technology was created and charged with reviewing the efficacy of new technologies and existing procedures. At the close of the decade it was far too soon to predict if this new health care technology review mechanism would have any effect on the growth of technology in medicine.

Consumer Cost Sharing

In theory, PSROs control health care costs by reviewing the utilization decisions made by individual physicians and their patients. Technology review may eventually influence the types of treatment available for use. An alternate way of reducing the health care expenditures by the federal government is to put more and more of the cost on the individual through deductibles and coinsurance. The Medicare program from its inception has employed both forms of cost sharing; Medicaid has used neither.

Medicare cost sharing, based on a formula that adjusts for increases in health care costs and changes in the economy, has increased every year since the program went into effect. In fact, in 1977, the dollar amount of the typical elderly person's "out-of-pocket" health care expenses was almost twice as large as in 1966, when Medicare was enacted. Medicare pays approximately 44 percent of the average elderly person's annual health expenditures. While the savings, both to the economy and to the federal government, of the Medicare deductible have not been determined, it is a certainty that the ever increasing deductible has become a thorny issue for the program's beneficiaries. Because Medicare coverage is limited, many elderly persons purchase additional private insurance or seek assistance from other government programs to cover—in whole or in part—the Medicare deductible and coinsurance. Third-party payors other than Medicare (both public and private) met 29.2 percent of the average elderly person's personal health expenditures in 1977 (Gibson and Fisher 1979).

Reimbursement Restrictions

Despite PSROs and increased Medicare cost-sharing, health expenditures continued to increase during the 1970s. Congress and program administrators next began to examine ways in which reimbursement for specific items covered by Medicare or Medicaid might be controlled. Examples of this strategy abound, especially in legislation under consideration at the close of 1979. Three examples, that have been in effect for several years, merit brief examination.

The first of these is the so-called MAC program, for "maximum allowable cost." Intended to limit federal government payment for certain drugs, the program determines a maximum cost for a particular drug and will not reimburse above this maximum. After several years, MACs for some drugs have been developed but the actual savings as a result of the program, after deducting the implementation and regulatory costs, are unknown. The MAC concept is closely tied to potentially broader effects of the generic drug substitution strategy. However, it was clear at the close of the last decade that neither MACs nor generic drugs had produced significant savings (Gagnon and Lane 1979; Goldberg, et al. 1979). Nonetheless, efforts to lower federal expenditures for prescription drugs will undoubtedly continue into the 1980s.

The enactment of Section 227 of P.L. 92-603 in 1972 provides another example of item-specific reimbursement controls, in this case related to the federal reimbursement for physicians' services provided in teaching institutions. Section 227 would limit the amount of money the federal government would pay for the services of teaching physicians under Part B, the medical insurance component of Medicare. Thus, teaching physicians would be restricted to compensation paid by the hospital, and included in the hospital's costs as billed under Part A of Medicare. Only rarely would teaching physicians be allowed to bill Part B for "private patients." The furor over this provision, and ensuing difficulties with HEW's efforts to develop regulations that would work, led Congress to postpone the effective date of this program. At the close of the decade, the law, as it was originally enacted in 1972, was theoretically in full force and effect. However, regulations which would allow implementation of the law remained on the drawing board.

A third strategy employed by the federal government to reduce its outlays for health care focuses on limitations on the amount it reimburses physicians for their services. Medicare pays most physicians on the basis of usual, customary and prevailing (UCP) charges. Initially, the prevailing charge for a given procedure (the highest fee the program will allow for the service) was set equal to the 83rd percentile of fees for that procedure in the physician's market area. In order to reduce program costs, in the early 1970s the prevailing charge was reduced to the 75th percentile. In the mid-1970s the system was modified further, linking increases in prevailing charges to the Medicare Economic Index. To the extent that fees increase more rapidly than the Economic Index (which is based on estimates of increases in the costs of providing medical services), the maximum allowable prevailing charges become limiting fee schedules for an increasingly large number of physicians.

Physicians who are willing to accept the UCP Medicare fees can "take patients on assignment," and submit their bills directly to Medicare intermediaries. Those who are unwilling to accept Medicare reimbursement levels submit bills directly to their patients. The patient in turn seeks reimbursement from Medicare and receives an amount based on the UCP system. Physicians treating Medicaid patients must agree to accept this program's reimbursement as payment in full. Medicaid payment has been found to be substantially lower than Medicare or Blue Cross levels of reimbursement (Burney, et al. 1978). It is interesting to note that reimbursement restrictions imposed during the 1970s may restrict the availability of health care for the poor and the elderly. The proportion of physicians willing to accept these patients may be positively related to the level of reimbursement (Holahan, et al. 1979). Over time, the percentage of Medicare claims accepted for assignment has dropped from 59.0 percent in 1968 to 50.6 percent in 1978 (Ferry, et al. 1980).

State-Level Hospital Rate Review

By far the largest proportion of health care spending is for hospital services. In 1978, 39.5 percent of total health care spending, as well as 56.5 percent of federal government health care spending was for hospital services. Physicians' services, the next largest category, comprised 18.3 percent of total health expenditures and 13.2 percent of federal health spending in 1978 (Gibson 1979). Traditionally, the federal government has reimbursed hospitals for services provided to Medicare and Medicaid beneficiaries on a cost-incurred basis. That is, the hospital is reimbursed for those costs attributable to treating Medicare and Medicaid patients—subject to limitations imposed by the programs.

Because payment is, by and large, dependent only on costs and not on how efficiently the services are produced, this system is partially responsible for the rising costs of care. Government cost-based reimbursement, however, does not recognize certain costs, for example, bad debts which result from uninsured patients not paying their hospital bills. Thus, some hospitals, especially those with a large number of indigent patients, do not recover significant portions of their expenses.

In response to the rising costs of hospital care and the need for increased efficiency, and in order to correct perceived inequities related to retrospective cost-based reimbursement, a number of states established commissions to review hospital charges. In some cases the cost-based system was replaced with one in which state authorities established rates prospectively. Several of these state review programs received "demonstration" grants from the federal government. Two of them, the programs in Maryland and the New Jersey, are of special interest.

Prior to the establishment of the Health Services Cost Review Commission (HSCRC), some of Maryland's hospitals were threatened with insolvency. Further, because Medicare and Medicaid disallowed certain hospital expenses, and because hospitals gave substantial (15 percent) discounts to Blue Cross patients, Medicare, Medicaid, and Blue Cross patients were subsidized by self-pay and commercially insured patients. The HSCRC was established with a mandate to keep hospitals solvent. The retrospective cost-based system was replaced with prospective budget review. The Blue Cross subsidy was significantly reduced, and, as part of a HCFA experiment, Medicare and Medicaid began to pay costs they formerly would not allow. Accordingly, payment for services is now more evenly spread across payors. Finally, the HSCRC instituted an experimental program in which hospitals received financial rewards for containing both utilization and costs per patient day. Proponents of the Maryland system argue that it has succeeded in both increasing equity and in reducing hospital cost increases.

Currently, the most "fashionable" rate review program is the New Jersey case-related reimbursement system. The articles by Thompson and Grimaldi in Part III of this volume present this reimbursement strategy in detail. Briefly, however, this program attempts to address directly a problem common to all hospital rate review systems: adjusting for differences in case mix. Based on discharge diagnosis, patients are assigned to "diagnosis related groups" (DRGs) and a fixed level of reimbursement is associated with each DRG for each hospital. This reimbursement is based on a formula related to the average patient-care cost for a specific DRG plus a proportion of hospital overhead and fixed costs. While it is too early to gauge the success of the New Jersey system (still being implemented in 1980), some policy makers believe that it may provide incentives for cost-effective delivery of hospital care.

During the first few years of the 1970s, the number of states with some form of hospital review program grew rapidly. However, by the end of the decade this trend had slowed. In 1979, no additional states adopted such programs and one, Colorado, repealed its rate review enabling authority. Whether state regulation of hospitals becomes the rule in the 1980s remains to be seen.

Hospital Cost-Containment Act

These efforts at reducing the rate of growth of health care costs have had only minimal or localized effects to date. Perhaps the most significant effort by the government, and in particular by the Carter Administration, to control health care expenditures was the introduction in 1977 of the Administration's Hospital Cost Containment Act. This legislation would have affected all hospitals and all sources of revenue. It would have established an across-the-board ceiling on allowable revenue increases with substantial penalties for violation of the guidelines in the law. It represented the most direct federal effort, to date, to attack health care costs. Neither the health care industry nor the Congress received the President's program enthusiastically. Weary of government regulation, concerned about the effects of the hospital cost-containment bill on their local communities, and vigorously lobbied by the health care sector, Congress rejected the President's mandatory cost-control device in 1979.

The health care industry responded to the Presidential challenge by creating its own program for health care cost containment. The American Medical Association, the American Hospital Association, and the Federation of American Hospitals joined to create the Voluntary Effort, a state-by-state system designed to encourage hospitals, and physicians, to adopt cost-effective practices while still maintaining the quality of services available to the public. The success of the Voluntary Effort has not been fully evaluated but there are some indications that health care cost increases have been reduced (Ginsburg and Wilson 1979). In the 1980s, it remains to be seen whether the Voluntary Effort can continue to combat health care cost increases now that the Damoclean sword of federal hospital cost-control legislation has been sheathed, at least temporarily.

National Health Insurance Debate

National Health Insurance (NHI), perhaps more than any other issue, mirrors the evolution of health care policy from the 1960s philosophy of expanding financing to the cost-containment oriented focus of the 1970s.

Following the initial success of the Medicare and Medicaid programs, the decade of the 1970s began with widespread interest in a National Health Insurance plan. The Nixon Administration; Senator Kennedy, Representative Corman, and organized labor; the American Medical Association; Senators Long and Ribicoff; the American Hospital Association; and others set forth NHI proposals. Reflecting trends already discussed, early NHI proposals were generally comprehensive and primarily concerned with universal insurance coverage and more extensive benefits. The great philosophical issue was the question of government control. Should NHI be totally run by the federal government? Or should it be a mix of private sector and government efforts, with the private sector being the dominant partner. Initially, both the Administration and the Congress largely ignored the issue of the costs of NHI proposals despite estimates of annual government outlays ranging from $20 billion to $80 billion.

By the mid-1970s, cost had become very important to sponsors of NHI proposals. In 1977, President Carter announced that cost controls were an essential step to any NHI plan. Politicans, remembering how Medicare and Medicaid had greatly expanded the use of health care services at considerable taxpayer expense, tried to find politically attractive NHI packages with economically acceptable price tags. The search was complicated by the extent of private health insurance coverage. Constituent pressure on behalf of NHI was not a significant factor in the NHI debate.

At the end of the decade of the 1970s, three major NHI themes had emerged. Catastrophic insurance coverage, to protect against the financial risks of severe chronic illness, was popularly touted as the solution to the nation's health care woes. Reasonably inexpensive to the government ($7 to $9 billion annually), catastrophic insurance would cover the big risks, the ones generally most feared by the voting public. Proponents argued that catastrophic NHI was the politicians dream—politically attractive and economically feasible. Opponents claimed that catastrophic NHI would provide additional incentives for the development and use (or abuse) of expensive medical technologies.

The second approach is some form of comprehensive NHI. Here sponsors have shifted their emphasis from plans with heavy government spending to plans in which much of the activity would be carried by private health insurers, under close federal regulation. Such ideas do not mollify opponents of government control of health care, but they do reduce the budgetary burden of the federal government, and also maintain some role for the private sector. In the end, however, the costs of the program would be borne by taxpayers—whether they buy premiums, or forego funds used by their employers to make premium contributions on behalf of employees.

The third major theme of National Health Insurance is seen in proposals to alter present reimbursement mechanisms. These ideas are not aimed at expanding insurance coverage as much as they attempt to make the insured more price conscious. Proposals include altering the tax system to limit deductions for health care expenditures or to set statutory ceilings on employers' contributions to health insurance premiums. In essence, more of the direct financial burden would be shifted to the individual. By "raising price consciousness" among individuals, proponents hope to encourage the public to seek the most efficient systems for financing and delivering health care, thereby increasing competition among insurers and providers of care.

The one thread uniting all of these more recent NHI concepts, compared to those from the early 1970s, is the reduction of federal outlays, either by lessening the direct cash expenditures of the government, or by curbing tax revenue losses caused by various tax deductions. Total expenditures for health care would not decline—indeed, they may well increase—but the government's share of these expenditures would fall relative to past NHI proposals.

Despite the intensity of the recent debate, another decade closed without Congressional action which would make enactment of National Health Insurance more likely. The pros and cons of NHI have been argued for three decades and will likely be argued for the next one as well.

Promotion of Competition

So far this discussion of federal cost-containment efforts has focused on three areas: 1) limiting expansion of health care facilities, 2) limiting expansion of health care manpower, and 3) limiting the amount the government pays to providers for services rendered under Medicare and Medicaid. In addition to these policies, the federal government sought to contain health care costs through increased competition. It should be noted that the promotion of competition is diametrically opposed to efforts of other government agencies, particularly those involved in health planning, to limit entry into the marketplace.

Promotion of competition has thus far taken two forms. The first is the energetic federal endorsement and encouragement of the development of health maintenance organizations (HMOs). The second is the activity by the Federal Trade Commission (FTC) to promote price competition within the health care industry.

Health Maintenance Organizations

In 1973, Congress accepted the view that the HMO, by virtue of its prepaid method of financing medical care, was, if not the panacea for all ills, at least a viable mechanism for reducing health care expenditures. First, this system of prepayment places the HMO at financial risk for providing comprehensive care with a defined, predetermined revenue base, to a specified enrollee population. Accordingly, HMOs have a financial incentive to deliver care cost-effectively. Analysts argue that principally HMOs have incentives to reduce enrollee hospital utilization. Second, the price competition HMOs offer to conventional health insurance plans may lead to a general reduction in costs to patients. The reduced costs may follow from both reduced fees and reduced use of expensive services, especially hospital services.

In the 1970s, a program of vigorous financial support for health maintenance organizations was begun. By 1975, however, Congress became convinced that the requirements placed on HMOs in order to qualify for federal assistances were unrealistically harsh. Congress perceived that the program must either be revised or fail. In 1976, the HMO Act significantly simplified the requirements for federal assistance. Since that time, Congress again modified the program, funneling even more money in the direction of HMOs in an effort to promote their growth.

HMOs have not developed according to the expectations of the sponsors of the legislation. The slow progress is viewed by some analysts as the fault of the health care industry as a whole, and especially as the fault of the resistance of many sectors of the industry to the development of the prepaid model. Other observers, however, question the intrinsic viability and generalizability of the HMO concept on a broad scale. Efforts to accelerate the growth of HMOs have, however, continued. For example, the latest revisions (P.L. 96-79) to the health planning law exempt many HMOs from Certificate-of-Need. For those HMOs that do not qualify for this exemption, other sections of the law limit the ability of planners to regulate their expansion. In addition, the 96th Congress has been considering legislation to increase the reimbursement for Medicare and Medicaid beneficiaries enrolled in HMOs. Finally, the Carter Administration is committed to the expansion of HMOs. If the President succeeds in winning a second term, this effort can be expected to be maintained as part of his continuing battle to reduce the growth of health care cost.

Empirical evidence collected to date indicates that, in fact, HMOs may provide care at less cost per person than conventional plans and that competition from HMOs may affect the performance of non-HMO health plans and physicians (Goldberg and Greenberg 1977; Luft 1978). However, the impact of HMOs on total health care spending is undetermined. First, while the number of enrollees has grown from 2.9 million in January 1970 to 8.8 million in December 1978, enrollees constitute only approximately 4 percent of the total U.S. resident population (Oral Communication, Office of Health Maintenance Organizations 1980). Secondly, given that patients are free to choose between systems, the ability of HMOs to reduce costs ultimately depends on patient preferences. Beyond some point, cost reduction will require a reduction in services and amenities. The potential reduction in expenditures per patient will be limited to the extent that patients value services and amenities over cost-savings.

Federal Trade Commission

By the mid-1970s the Federal Trade Commission (FTC) became interested in the health care industry and began investigating what it considered to be the anti-competitive characteristics of that industry. The first target was the advertising of medical services. The FTC argues that medical care services are not unique and that advertising these services can improve competition in the industry. Accordingly, the FTC maintains that restrictions on advertising medical services inhibit competition. Organized medicine counters that it does not oppose advertising, only solicitation and misrepresentation. Medicine also argues that some constraints are essential to protect patients from deceptive practices. The matter is currently before the courts.

The FTC is also investigating the effects of physician membership on the governing boards of health insurance organizations and prepaid plans. It is alleged that physician domination of these bodies leads to increased health care costs. The results in terms of cost and/or quality of care, if any, of FTC activities related to health care will not be known for some time.

THE 1980s—ACCESS VS. COSTS

The 1960s was a decade of expansion in health care. No problem seemed insoluble if only enough money could be spent. Certainly the groundwork was laid for vast improvements in the accessibility of health care, but this advancement carried a large price tag. Within ten years this success was called "excess" by many and the pendulum swung away from growth to constraint. The issue facing the Congress in the 1970s was no longer how to encourage growth, but how to continue to live up to the promises of guaranteed access to health care without drowning in red ink.

Analysis of the government's efforts in the 1970s to meet this challenge reveals no clear pattern. Often the government's right and left hands seemed to adopt opposing approaches, as witnessed by the creation of the essentially anti-competitive health planning law concomitant with the FTC's drive to open the health care industry to more competition. The safest conclusion to draw about the last decade is that the ultimate answer to the problem of maintaining access to care in a time of budget restraint was not found. The safest prediction for the decade of the 1980s is that the search will continue.

The effort to restrain health care costs is complicated by continued growth in personnel and facilities. Health professions schools continue to produce graduates at record levels. Despite the pressures of money and health planning, hospitals still expand and add new services. So much expansion is already underway that it may be another ten years before significant slowdowns occur. Continued attempts to reduce government spending in these areas can be expected, resulting in part from the desire to hold down health care costs and in part because federal resources may be diverted to other areas, such as energy production and defense spending.

Federal budget cuts may help reduce health care spending, but keeping the 1960s promise of access to health care demands efficiency as well as frugality. Some way will have to be found to use health care resources so as to maximize the return to patients from every health care dollar spent. The answers do not appear to lie in the decisions of the late 1970s, yet movement in those same directions can be expected for several years.

One of the anomalies of the 1980s may well be the deregulation of such industries as transportation and broadcasting, simultaneously with the growth of federal regulation in the health care sector. Some of this regulation will be designed to protect the public, such as increased controls over biomedical research, but most will be efforts to reduce the pressures on the federal budget. Physician fee schedules and other reimbursement controls are waiting to be tried. In fact, the defeat of hospital cost-containment legislation may lead to administrative actions and state regulation, which require no new federal legislation, yet achieve much the same regulatory impact on health care. The theme of most regulatory initiatives in federal health care financing will be to reduce the amount the government will have to pay for health care services. Accompanying these initiatives could well be efforts, either legislative or regulatory, to keep the providers of medical services from passing on to patients too much of the difference between the cost of the service and the reimbursed amount.

On the competition front, the FTC and the Justice Department will continue their investigations of the health care marketplace. Congress will debate, and possibly pass, tax-reform legislation aimed at increasing competition among the health plans offered to employees as part of "fringe benefit" packages. HEW (or, in the 1980s, the Department of Health and Human Services) will develop additional economic incentives to promote alternative delivery systems. Even the health planners have been asked to encourage competition whenever possible.

The government's current enthusiasm for HMOs will likely continue. If HMOs, and other prepaid plans, cannot deliver on the promises others have made on their behalf, however, Congressional and Presidential enthusiasm will quickly diminish. The 1980s will probably be the time when enough evidence is available to evaluate the claims for such plans. If substantiated, they will become significantly more prevalent by the end of the decade. If not, then HMOs will remain only one alternative to be selected by a minority of patients and practitioners.

In the 1980s, the federal government is expected to initiate policies to increase price competition in the health care sector; at the same time, the government will pursue increasingly detailed regulation of health care providers. That the increased regulation may, in fact, hinder competition, will likely not matter to many policy makers.

CONCLUSION

For at least the first half of the 1980s the relationship between the federal government and the health care industry probably will be more of the same. The regulatory and legislative responses in the 1970s to the enormous growth of the industry, resulting from decisions made in the 1960s or earlier, have not matured. Although Congress may tinker with specifics, the basic framework of increased government regulation of all aspects of health care seems likely to remain untouched for some time. As the effects of the health manpower decisions of 1963 and 1965 were really not visible for at least ten years, thus, the results of the choices made concerning health planning in 1974 or personnel in 1976 will not be apparent for many years. It is equally likely that these latter results will be no more predictable than were the former.

By 1965, the federal government was committed to assuring all citizens access to health care and took the steps to expand the three elements—personnel, facilities, and money—necessary to achieve that goal. In 1980, that commitment remains, yet constraints on all three factors are in place and will remain so for some time. The decade of the 1980s may well determine if the government can indeed do more with less.

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Part II—Patterns of Medical Practice

This section provides an overview of changes in certain characteristics of medical practice during 1979, and of trends observed during the 1970s. Topics include the relative prices of medical care services; physicians' fees, income, and expenses; characteristics of female physicians; and physicians' mobility patterns.

In "Relative Changes in Medical Care Prices: The Consumer Price Index, 1970-1979," Gerald L. Glandon and Roberta J. Shapiro update and expand similar analyses from previous editions of Profile. Particular emphasis is placed on changes in the physicians' services component of the Consumer Price Index relative to other components of this index during 1979 and over time.

"Trends in Physicians' Incomes, Expenses and Fees: 1970-1979," by Gerald L. Glandon and Roberta J. Shapiro, updates information included annually in Profile. This article reports data from the most recent AMA survey of physicians and focuses on changes in physicians' incomes relative to changes in expenses, fees, and selected general economic indices.

Recently, the demographic and professional characteristics of physicians have changed substantially. Lorna E. Wunderman focuses on the increased number and proportion of women in the physician pool, describing their past and present characteristics, in "Female Physicians in the 1970s: Their Changing Roles in Medicine."

Steven R. Steiber analyzes the "Geographic Mobility of Physicians: 1971-1975" noting gross and net migration patterns of physicians across the United States. The potential policy relevance of this paper, both current and future, concerns the differences that exist between physicians who moved and those who did not move during the 1971-1975 period.

Relative Changes in Medical Care Prices: The Consumer Price Index, 1970-1979 *by*

*Gerald L. Glandon and Roberta J. Shapiro**

INTRODUCTION

During 1979 and the early months of 1980, the economy in general, and inflation in particular, became the primary issue of concern to the American public and its leaders. Despite a program of voluntary wage and price controls, first implemented in 1978, the Consumer Price Index (CPI), a broad measure of the price of a market basket of consumer goods and services, rose by 13.3 percent during 1979. This increase appears dramatic, when it is considered that a 5.5 percent rate of inflation in 1970 was considered serious enough to initiate the Economic Stabilization Program of mandatory wage and price controls from August 1971 to April 1974.

As the Carter Administration focused its efforts on voluntary wage and price restraints during 1979, for a second year the health care sector continued a Voluntary Effort to Contain Health Care Costs (VE). Although causality may not be inferred, aggregate medical care prices and the prices of physicians' services increased less rapidly than the general price level in 1979. Relative to increases in the all items index (13.3 percent) and all services index (13.7 percent) of the CPI, the medical care index increased by a comparatively small 10.1 percent and the prices of physicians' services rose only 9.4 percent during 1979.

This report discusses changes in the CPI during calendar year 1979, focusing particularly on the medical care components of the CPI. In addition, the report examines trends in consumer prices in general and medical care prices in particular, during the decade of the 1970s. Annualized average rates of change will be utilized throughout this report so that price increases over periods of varying duration can be compared. Appendix A explains the computation of this annualized average.

In the sections which follow, changes in the medical care component, the prices of physicians' services, and selected components of the CPI are reviewed for 1979 and compared with changes that occurred during 1978. Subsequent sections present an historical perspective by examining selected components of the CPI during the period 1970 to 1979. Those sections also pay particular attention to the medical care price index and its components.

This report uses data from the Consumer Price Index for All Urban Consumers (CPI-U), compiled by the Bureau of Labor Statistics.

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These data represent about 80 percent of all U. S. consumers and are the most comprehensive and representative price information available. However, because the CPI was substantially revised in 1978, only limited comparisons can be made between current price changes and those changes occurring prior to 1978.

CHANGES IN COMPONENTS OF THE CONSUMER PRICE INDEX 1978 AND 1979

Medical Care and its Components

Table I presents annual percentage increases in selected components of the medical care index of the CPI for 1978 and 1979. Table II displays annualized rates of change for these measures in each of the calendar quarters of the two years.

Analysis of the data in Table I indicates that, with only a few exceptions, the rate of increase of the indices reported was greater in 1979 than in 1978. The physicians' services price index rose 8.1 percent in 1978 and 9.4 percent in 1979. The annual increases in physicians' services prices were less than the increases in the medical care index for the corresponding years (8.8 percent in 1978 and 10.1 percent in 1979). Further, the increases in physicians' services prices were less than the increases in the all items index in both 1978 and 1979 (9.0 percent in 1978 and 13.3 percent in 1979).

Table I—Annual Percentage Increases in Selected Components of the Medical Care Component of the CPI, 1978 and 1979

Item	1978	1979
All Items	9.0	13.3
Medical Care	8.8	10.1
Medical Care Commodities	7.3	7.6
Prescription Drugs	8.3	7.5
Nonprescription Drugs and Medical Supplies	6.5	7.6
Medical Care Services	9.2	10.6
Physicians' Services	8.1	9.4
Dental Services	7.2	9.7
Hospital Room Charge	12.4	11.1

Source: CPI Detailed Reports for December 1977 and December 1978. December 1979 figures derived from oral communication Bureau of Labor Statistics, Washington, D. C., January 25, 1980.

The medical care services price index increased more in 1978 than did the medical care index as a whole. Further, the gap between the increase in the medical care services component and the broad medical care index was even larger in 1979. These statistics reflect recent increases in the rate of growth of elements in medical care services that traditionally have increased slowly. Primary among these is the increase in the rate of growth of the price of dental services from 7.2 percent in 1978 to 9.7 percent in 1979. Other points of interest concerning the medical care services price index include:

- In 1979, physicians' services prices increased by 9.4 percent—less than the increase in medical care services prices (10.6 percent) or the increase in medical care prices (10.1 percent); however, physicians' services price increases were closer to increases in both medical care services and medical care in 1979 than in 1978.
- Hospital room charges increased more rapidly in both 1978 and 1979 (12.4 percent and 11.1 percent, respectively) than the other components of the medical care index reported.
- The rate of increase in the hospital room charge index declined from 1978 to 1979 in spite of increases in the rate of increase in the medical care services, medical care, all services, and all items price indices.

Medical care commodity prices rose at lower rates than the overall medical care index in both 1978 and 1979, although the rate of increase in medical care commodities prices rose slightly, from 7.3 percent in 1978 to 7.6 percent in 1979. Other points of interest concerning medical care commodities include:

- The prescription drug price increase was lower in 1979 than in 1978 (7.5 percent versus 8.3 percent, respectively).
- Nonprescription drugs and medical supplies, which consist of eyeglasses, medical supplies, and over-the-counter drugs, increased more in 1979 than in 1978 (7.6 percent versus 6.5 percent, respectively).
- The increase in the rate of increase in nonprescription drug prices from 1978 to 1979 (16.9 percent) exceeded the increase in the rate of increase in medical care commodities prices (4.1 percent) in the same period.

Table II presents annualized rates of change for each of the calendar quarters in 1978 and 1979 for a selected set of components of the medical care index. While few obvious trends are evident, the data in this table serve to demonstrate the volatility of the indices. For example, during the two-year period, annualized increases in the hospital room charge index ranged from 15.2 percent in the fourth quarter of 1978 to 5.3 percent in the second quarter of 1979.

As noted above, most indices increased at greater rates in 1979 than in 1978. This is evident from the annualized rates presented for the all items index, which increased more rapidly during each quarter of 1979 than during the corresponding quarter in 1978. In fact, the annualized increase in each quarter in 1979 surpassed the largest quarterly increase in 1978. Other points of interest concerning the quarterly data presented in Table II include:

- The annualized rate of growth of physicians' services prices was larger in each quarter of 1979 compared to the corresponding quarter of 1978, except for the final quarter.
- The hospital room charge index rose less in each quarter of 1979 than in the corresponding quarter of 1978.
- The annualized rate of increase in the fourth quarter of 1979 was the highest in the eight-quarter period for medical care, medical care services, and dental services. Further, it was the second highest quarter for hospital room charges and medical care commodities. This is in contrast to the smallest 1979 quarterly change in the all items index reported in the fourth quarter of 1979.

Major Components of the CPI

Table III presents annual percentage increases in the all items index of the CPI, the seven components of the all items index, and three special indices, for 1978 and 1979. Most notably, Table III illustrates that, with the exception of food and beverages, the rate of growth of the all items index and each of its components rose substantially in 1979 over 1978. In 1979, energy appears to have played a major role in the increased rate of inflation as measured by the CPI.

The rate of increase of medical care prices rose to 10.1 percent in 1979 and was nearly 15 percent larger than the 8.8 percent increase that occurred in 1978. However, the all items index rose 9.0 percent in 1978 and 13.3 percent in 1979, an increase of about 48 percent.

The rate of increase reported for the all items index is a weighted average of the rates of increase of the seven components listed in Table III. This average is computed by weighting the percentage increase in each component by the proportion of total consumer expenditures it represents, i.e., its share of the typical consumer's "market basket." These weights, which are adjusted annually, affect the relative importance of each of the seven components of the all items index. For example, in 1979 housing represented 44.3 percent of total consumer expenditures. Price increases in the housing component are the single most influential component in the all items index.

In 1979, only price increases for housing (15.2 percent) and transportation (18.2 percent) exceeded the increase in the all items index (13.3 percent), but these two components represented 62.1 percent of total consumer expenditures. The three components with

Table III—Annual Percentage Increases in Major Components of the Consumer Price Index, 1978 and 1979

Major Components	Percentage Increase 1978	1979
All Items	9.0	13.3
Food and Beverages	11.6	10.0
Housing	9.9	15.2
Apparel and Upkeep	3.2	5.5
Transportation	7.7	18.2
Medical Care	8.8	10.1
Entertainment	5.8	6.9
Other Goods and Services	6.4	7.9
Special Indices		
All Services	9.3	13.7
All Commodities	8.9	13.0
Energy	8.0	37.4

Source: CPI Detailed Report for December 1977 and December 1978. December 1979 figures derived from oral communication Bureau of Labor Statistics, Washington, D. C., January 25, 1980.

relatively small percentage price increases, apparel and upkeep (5.5 percent), entertainment (6.9 percent), and other goods and services (7.9 percent) together represented only 13.7 percent of total consumer expenditures.

Energy, a special index presented in Table III, warrants particular attention. This index is created from a combination of energy components included in the housing and transportation components of the CPI. Energy represents about 8.5 percent of total consumer expenditures.[1] In 1978, the energy index rose 8.0 percent; however, in 1979, the energy index rose 37.4 percent, an increase in the rate of growth of almost 370 percent. The increase in the rate of growth of the housing and transportation components reflects the extraordinary increase in energy prices in 1979 relative to 1978. To further illustrate the impact of energy, the all items index was recomputed with energy components deleted. In 1979, the all items less energy index rose 11.1 percent compared to the 13.3 percent increase with energy included.

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[1] It must be remembered that the CPI represents only consumer expenditures for goods and services used for final consumption. The energy index represents such items as home heating oil and gasoline used by consumers. The impact of energy as an input used to produce goods and services will not be accounted for directly by this index.

Summary of CPI Changes in 1978 and 1979

Figure 1 presents percentage increases in selected components of the CPI in 1978 and 1979. While the data have appeared in either Tables I or III above, this presentation emphasizes the increase in the rate of inflation of 1979 over 1978 and puts the increase in the selected components in broader perspective. The figure shows that the rates of increase in both the CPI all items and the all services indices exceeded the rates of increase in all of the medical care indices in 1979. Indeed, none of the medical care indices increased more quickly than the 11.1 percent growth in the all items less energy index in 1979.

TRENDS IN CHANGES IN SELECTED COMPONENTS OF THE CPI 1970-1979

Table IV presents annual, December-to-December increases in selected components of the CPI for the years 1970-1979 and the average annual implied percentage increases for the ten-year period. This table is accompanied by Figure 2 which plots annual percentage increases for the all items and physicians' services price indices over the ten years, 1970-1979.

The annual percentage increase in the physicians' services component of the CPI exceeded the annual increases in the all items index for six of the ten years reported and for the period as a whole. Only for the two full calendar years for which the Economic Stabilization Program was in effect (1972 and 1973) and the two calendar years since the beginning of the Voluntary Effort (1978 and 1979) has the physicians' services price index increased less than the all items index. For the period as a whole, physicians' services prices rose 8.1 percent on an annual basis versus a 7.4 percent annual increase in the all items index.

Interestingly, during the ten-year period reported, the all services index (which includes physicians' services) increased more than the all items index in all but a single year. For the period as a whole, the all services index increased 7.9 percent per year while the all items index increased 7.4 percent per year, on average.

Other points of interest concerning the trends in prices reported include:

- Medical care as a whole and physicians' services increased nearly an equal amount over the ten-year period (8.0 percent versus 8.1 percent per year, respectively). On a year-by-year basis, medical care price increases exceeded physicians' services price increases in five of the ten years.

- Hospital room charges increased at a greater average annual rate than medical care as a whole for the entire period (11.2 percent versus 8.0 percent, respectively) and for each year individually.

- Dental services prices increased at a lower annual rate than physicians' services prices for the period as a whole (6.8 percent versus 8.1 percent, respectively) and for seven of the ten years individually.

- Prescription drug prices increased at a lower annual rate for the entire period than did medical care as a whole or any of the other medical care components presented. The increase in this component was 3.9 percent per year for the entire period; however, for the first four years, the implied percentage increase was 0.1 percent per year versus a 6.4 percent per year average increase for the last six years of the period.

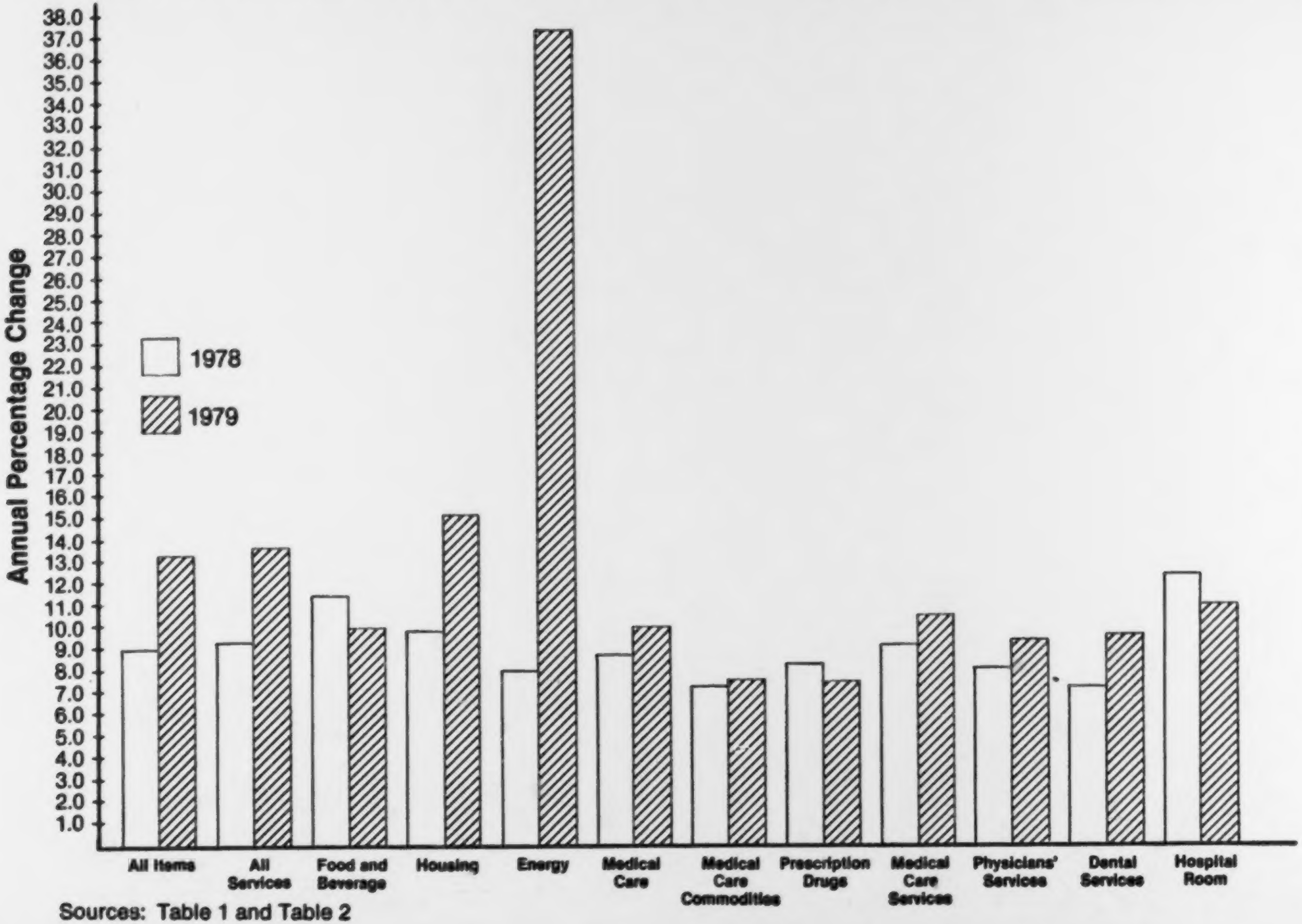
Figure 2, which plots annual increases in both physicians' services prices and the all items index, illustrates the similarity in the movement of these two indices. While physicians' services prices have generally increased at a greater rate than the all items index, the two indices generally reach short-term peaks and troughs in the same years.

Table II—Annualized Rates of Growth in Selected CPI Components During Calendar Year 1978 and 1979

	1978				1979			
Component	First Quarter Jan.-March	Second Quarter April-June	Third Quarter July-Sept.	Fourth Quarter Oct.-Dec.	First Quarter Jan.-March	Second Quarter April-June	Third Quarter July-Sept.	Fourth Quarter Oct.-Dec.
All Items	8.2	12.1	8.4	7.4	12.8	15.1	13.2	12.2
Medical Care	10.3	6.5	8.9	9.7	11.2	6.7	10.5	12.0
Medical Care Commodities	9.3	7.0	4.8	8.2	7.5	7.1	6.7	9.0
Prescription Drugs	11.9	6.0	5.0	10.3	9.1	6.2	6.4	8.3
Medical Care Services	10.6	6.4	9.9	9.9	11.9	6.7	11.2	12.6
Physicians' Services	9.5	6.4	9.1	7.6	11.9	7.4	11.4	6.8
Dental Services	6.7	6.8	7.1	8.4	11.4	7.8	5.5	14.1
Hospital Room Charge	14.0	6.6	13.9	15.2	12.9	5.3	11.9	14.5

Source: CPI Detailed Report for December 1977; March 1978; June 1978; September 1978; December 1978; March 1979; June 1979; and September 1979. December 1979 figures derived from oral communications, Bureau of Labor Statistics, Washington, D. C., January 25, 1980.

Figure 1 · Annual Percentage Increases in Selected Components of the CPI, 1978 and 1979



Sources: Table 1 and Table 2

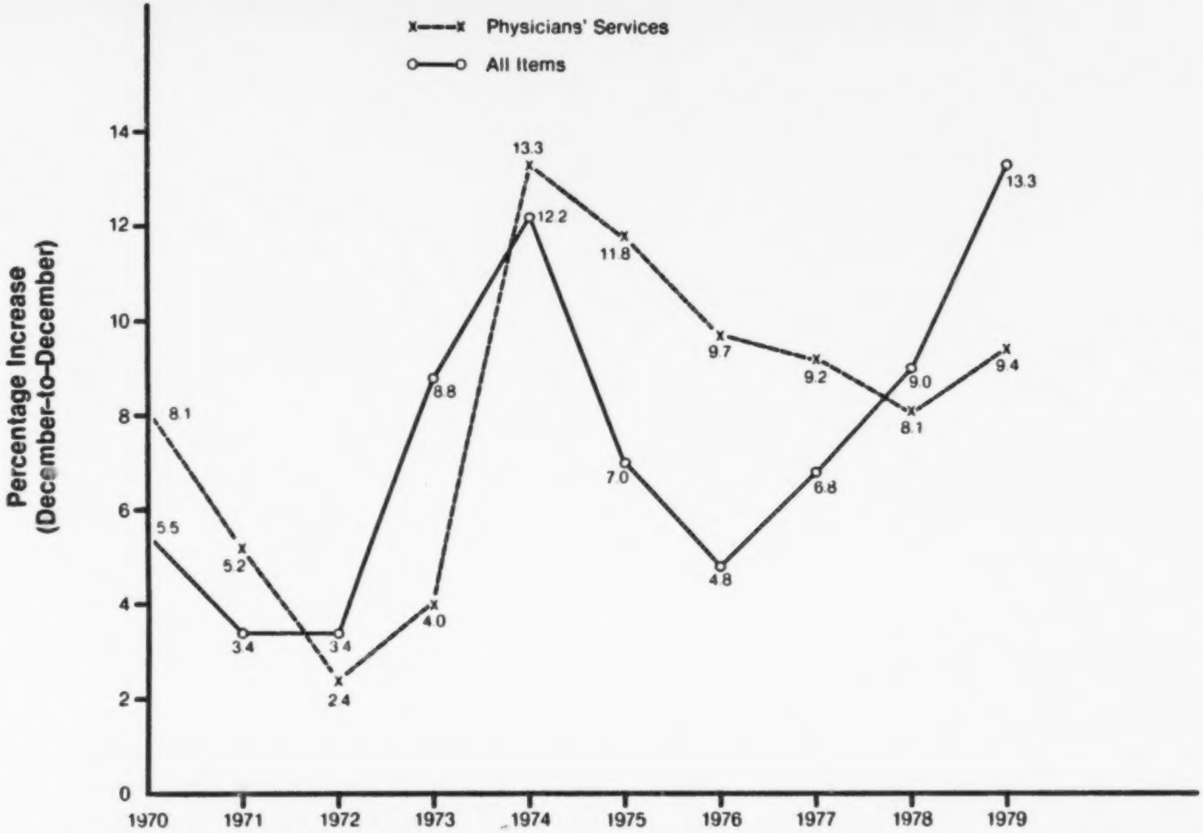
Table IV—Annual Percentage Increases in Selected Components of the Consumer Price Index, 1970-1979*

Selected Components	Average Annual Percentage Increase 1970-1979	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
All Items	7.4	5.5	3.4	3.4	8.8	12.2	7.0	4.8	6.8	9.0	13.3
All Services	7.9	8.2	4.1	3.6	6.2	11.3	8.2	7.3	7.9	9.3	13.7
Food and Beverages	7.7	2.5	4.2	4.4	18.5	12.0	6.2	7.1	7.6	11.6	10.0
Housing	7.9	7.1	3.4	3.4	6.9	13.4	7.5	5.4	7.6	9.9	15.2
Medical Care	8.0	7.3	4.8	3.3	5.2	12.4	9.9	10.1	8.8	8.8	10.1
Prescription Drugs	3.9	0.1	1.5	-1.2	0.2	5.2	5.7	5.0	7.1	8.3	7.5
Physicians' Services	8.1	8.1	5.2	2.4	4.0	13.3	11.8	9.7	9.2	8.1	9.4
Dental Services	6.8	5.5	6.4	2.8	3.7	11.4	7.8	6.8	7.3	7.2	9.7
Hospital Room Charge	11.2	14.0	9.2	5.0	5.7	16.5	14.7	13.0	10.8	12.4	11.1

*Percentage increases are computed using December-to-December indices for each year.

Source: Consumer Price Index for data 1970-74. CPI Detailed Report for data December 1975-December 1978. Oral communication, Bureau of Labor Statistics, Washington, D. C., January 25, 1980 for December 1979.

Figure 2 · Percentage Increase in All Items and Physicians' Services Components of the Consumer Price Index 1970 to 1979



Source: Bureau of Labor Statistics

Appendix

An Explanation of the Method Used to Compute the Implied Average Annual Percentage Change

This report presents average annual percentage changes in the Consumer Price Index (CPI) and some of its components for calendar 1979 and other selected time periods. The observed change is the result of the action of an annual percentage change compounded over the observed time period.

The method of deriving the average annual percentage change is straightforward. From an initial time period (t_o) to a final time period (t_n) the change in the CPI can be shown as:

$$CPI_{t_n} = CPI_{t_o} \times (1 + r)^n,$$

where $\underline{r}$ is the constant percentage change per unit of time and $\underline{n}$ is the number of periods between t_o and t_n. Solving for $\underline{r}$, one obtains:

$$r = \left(\frac{CPI_{t_n}}{CPI_{t_o}} \right)^{1/n} - 1.$$

Thus, to solve for the average annual percentage change in CPI from 1970 to 1979, one substitutes

$$r = \left(\frac{\text{CPI/Dec. 1979}}{\text{CPI/Dec. 1969}} \right)^{1/10} - 1$$

The ratio of the CPIs is taken to the 1/10th power because there are 10 years from 1970 to 1979. $\underline{r}$, then, is the average annual percentage change in the CPI implied by the observed change in the index number from 1970 to 1979.

Trends in Physicians' Incomes, Expenses, and Fees: 1970-1979 *by Gerald L. Glandon and Roberta J. Shapiro**

INTRODUCTION

Price increases in the economy have received continued attention since the 1978 introduction of President Carter's Voluntary Wage and Price Standards.[1] The greater emphasis on professional fees in general and physicians' fees in particular, however, has declined recently, in part, as a result of relatively more rapid price increases for other sectors of the economy. Still, changes in physicians' fees remain of interest because of the continuing private sector voluntary program to contain fee increases.

While the most commonly used fee data come from the Consumer Price Index, published by the Bureau of Labor Statistics, the AMA Periodic Survey of Physicians (PSP) also collects certain types of fee data. These AMA data allow comparisons of fees with other measures of the performance of medical practice, for example, the relationship of physicians' average net incomes and expenses from medical practice to fees may be examined. An understanding of these relationships will increase our ability to understand the impacts of voluntary (or mandatory) efforts to control fees might have on medical practice.

This report utilizes preliminary data from the AMA's Thirteenth PSP to examine trends in physicians' incomes, expenses, and fees. The object of this report is not to provide a detailed analysis of these trends, but to provide an overview of the performance of these three characteristics of medical practice. Net incomes, expenses, and fees are discussed individually followed by a section that explores some interrelations of these factors.

NET INCOME

Data on physicians' pre-tax, average net income from medical practice, and the average annualized percentage growth of net income are presented in Table I. Physician income data are examined in aggregate, and for seven major specialty groups for the nine-year period 1970 through 1979.[2] The typical physician's income increased 64.1 percent during this period. This total increase implies an average annualized growth of 5.7 percent, between 1970 and 1979.

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*Gerald L. Glandon, Ph.D., and Roberta J. Shapiro, M.P.H., are both Research Associates, Center for Health Services Research and Development, American Medical Association. The views expressed in this paper are those of the authors and do not necessarily represent the official policy or position of the American Medical Association.

[1] Under the program, increases in professional fees were limited to 6.5 percent per year.

[2] Throughout this report the average net incomes and expenses used for 1979 and 1976 were projected by respondents. There is limited evidence that during periods of rapid inflation, such as occurred in 1979, physicians underestimate both their net incomes and expenses. These 1979 and 1976 data should be regarded with caution.

Turning to individual specialties, generally those specialty groups with high levels of net income in 1979 had higher annualized rates of growth in net income over the period. For example, surgeons had the highest mean expected net income in 1979 ($86,800) and had the second fastest annualized rate of growth (6.2 percent) for the nine-year period. Anesthesiologists expected the second largest net incomes in 1979 ($78,100), and had the most rapid annualized increase in income (7.9 percent). The converse of the generalization also holds. Psychiatrists expected the lowest level of net income in 1979 ($53,200) and had the smallest annualized rate of increase (3.2 percent). Pediatricians anticipated the second lowest level of net income in 1979 ($54,400) and had, with obstetricians and gynecologists, the second lowest annualized rate of increase (5.1 percent).

The ranking of rates of growth of net income by specialty hides changes in the ranking of the levels of income that have occurred over the nine-year period. While anesthesiologists had the second largest income in 1979 and the largest annualized rate of growth in income over the period, their income level rose from fifth in 1970 to second in 1979. Surgeons' average net incomes were the largest of the specialties presented for both 1970 and 1979. The only other major change in ranking occurred for psychiatrists, the slowest growth specialty, who fell from fourth in 1970 to last in 1979.

The typical physician's net income from professional practice increased, on average, 5.7 percent annually between 1970 and 1979. Year-to-year increases varied substantially, from a low of 2.9 percent between 1976 and 1977, to a high of 8.5 percent between 1974 and 1975. (See Table II.) This 8.5 percent increase in 1975, and the 7.0 percent increase in 1974, may represent a "catching up" period for physicians following the period of wage and price controls. During the control years, physicians' incomes grew relatively slowly (4.2 percent in 1972, and 3.0 percent in 1973). Data projected by physicians for 1979 indicate a 4.7 percent increase in average net income from medical practice, down substantially from the 7.0 percent increase reported for 1978.

PRACTICE EXPENSES

Table III presents average practice expenses reported by physicians over the period 1970 through 1979. Average professional expenses are reported separately for seven selected specialty groups, and for all specialties together. Over the nine-year period, 1970 through 1979, physicians' expenses more than doubled. This represents an average annual increase in expenses of 8.3 percent—2.6 percentage points more than the average annual increase in net incomes. Viewed differently, the percentage of the typical physician's gross income accounted for by expenses increased during the nine-year period, and the percentage attributable to net income decreased. (See Figure 1.)

The percentage increases in physicians' average professional expenses varied among the specialties presented. With the exception of anesthesiologists, high expense specialties in 1979 tended to have the largest annual growth in expenses for the period. Surgeons expected the highest average expenses in 1979 ($67,500) and tied with anesthesiologists for the highest annualized growth in expenses (10.7 percent) for the entire period. Obstetricians and gynecologists reported the second largest expenses ($65,500) and the third largest annualized rate of growth in expenses (10.0 percent). On the other hand, pediatricians reported the fifth largest average expenses ($36,800) and the smallest annualized increase (4.4 percent). Anesthesiologists are an exception to this rule because they had the second smallest expenses ($28,000) but the largest annualized rate of increase in expenses (10.7 percent).

The seven specialties reported here can be divided into three groups on the basis of expenses. The surgical specialties, surgeons and obstetricians and gynecologists, expect the highest expenses in 1979, $67,500 and $65,500, respectively. Three medical specialties—General and Family Practice, Internal Medicine, and Pediatrics—form the second level, expecting 1979 expenses to total $51,600, $49,200 and $36,800, respectively. Finally, anesthesiologists and psychiatrists form the third level, with expected expenses of $28,000 and $25,600, respectively. The 1979 figures are in contrast to those in 1970, when the specialties clearly fell into two distinct expense groups. The low expense specialties were still Psychiatry and Anesthesiology ($13,300 and $11,000, respectively). All of the remaining specialties reported expenses within a narrow range, $24,200 - $27,700.

The year-to-year percentage increases in the typical physician's practice-related expenses vary widely over the period, 1970 through 1979. (See Table II.) Expenses increased by 18.9 percent in 1971, compared to only 2.0 percent in 1978. Physicians' expenses were projected to increase 7.5 percent during 1979. For six of the nine years examined, expenses grew by a larger percentage than the percentage growth in net income. (See Figure 2.)

FEES

Table IV presents information on the average fee for an initial office visit for the period 1970 through 1979 (comparable data were not available for 1972 or 1977). This paper discusses the average initial office visit fee (IOVF) for all physician respondents and for selected specialties, omitting specific presentations of these data for anesthesiologists and radiologists.

Table I—Average Net Income from Medical Practice by Specialty, 1970-1979

Specialty	1970	1971	1972	1973	1974	1975	1976[b]	1977	1978	1979[b]	Compound Percentage Growth 1970-1979
All Specialties[a]	$41,800	$45,300	$47,200	$48,600	$52,000	$56,400	$59,500	$61,200	$65,500	$68,600	5.7%
Gen. Prac.	33,900	39,800	41,300	41,900	44,700	45,400	47,400	51,200	54,600	55,500	5.6
Int. Med.	40,300	42,900	44,700	47,800	51,400	57,000	60,500	61,500	63,800	66,800	5.8
Surgery	50,700	54,000	56,000	57,200	60,500	68,200	73,200	74,000	82,600	86,800	6.2
Pediatrics	34,800	38,500	38,900	41,200	42,100	44,300	47,000	48,200	51,200	54,400	5.1
Ob./Gyn.	47,100	51,100	53,200	55,400	61,700	63,300	65,800	69,900	70,300	73,600	5.1
Psychiatry	39,900	37,200	39,100	38,500	41,300	44,800	47,600	48,200	50,200	53,200	3.2
Anesthesiology	39,400	47,300	49,500	48,100	54,400	57,100	60,100	65,500	74,200	78,100	7.9

[a] Total includes Radiology and "Other" categories. [b] Projected by physician respondents.

Source: Periodic Survey of Physicians, 1972-1979. Center for Health Services Research and Development, American Medical Association.

Table II—Annual Percentage Change in Physicians' Average Gross Income, Professional Expenses, Net Income, and Initial Office Visit Fee, 1970-1979

	Annual Percentage Change				
Year	Average Gross Income	Average Professional Expenses	Net Income	Initial Office Visit Fee	All Items Component of the CPI[a]
1970-1971	12.3%	18.9%	8.4%	12.4%	4.4%
1971-1972	5.8	8.3	4.2	3.0[c]	3.0
1972-1973	2.9	2.9	3.0	3.0[c]	5.7
1973-1974	6.4	5.6	7.0	15.1	11.5
1974-1975	10.3	13.2	8.5	8.4	9.6
1975-1976[b]	7.4	10.1	5.5	17.3	5.4
1976-1977	4.7	7.3	2.9	5.4[d]	6.7
1977-1978	4.9	2.0	7.0	5.4[d]	7.7
1978-1979[b]	5.9	7.5	4.7	10.4	11.3
Entire Period 1970-1979	6.7	8.3	5.7	8.8	7.2

[a] Percentage change computed using the July index numbers. [b] Income and expense data for 1976 and 1979 projected by respondents. [c] Comparable fee data do not exist for 1972, annual average computed using 1971 and 1973 fees. [d] Comparable fee data do not exist for 1977, annual average computed using 1976 and 1978 fees.

Sources: Periodic Survey of Physicians, 1972-1979. Center for Health Services Research and Development, American Medical Association.

Consumer Price Index (Bulletin), Bureau of Labor Statistics, Washington, D. C.

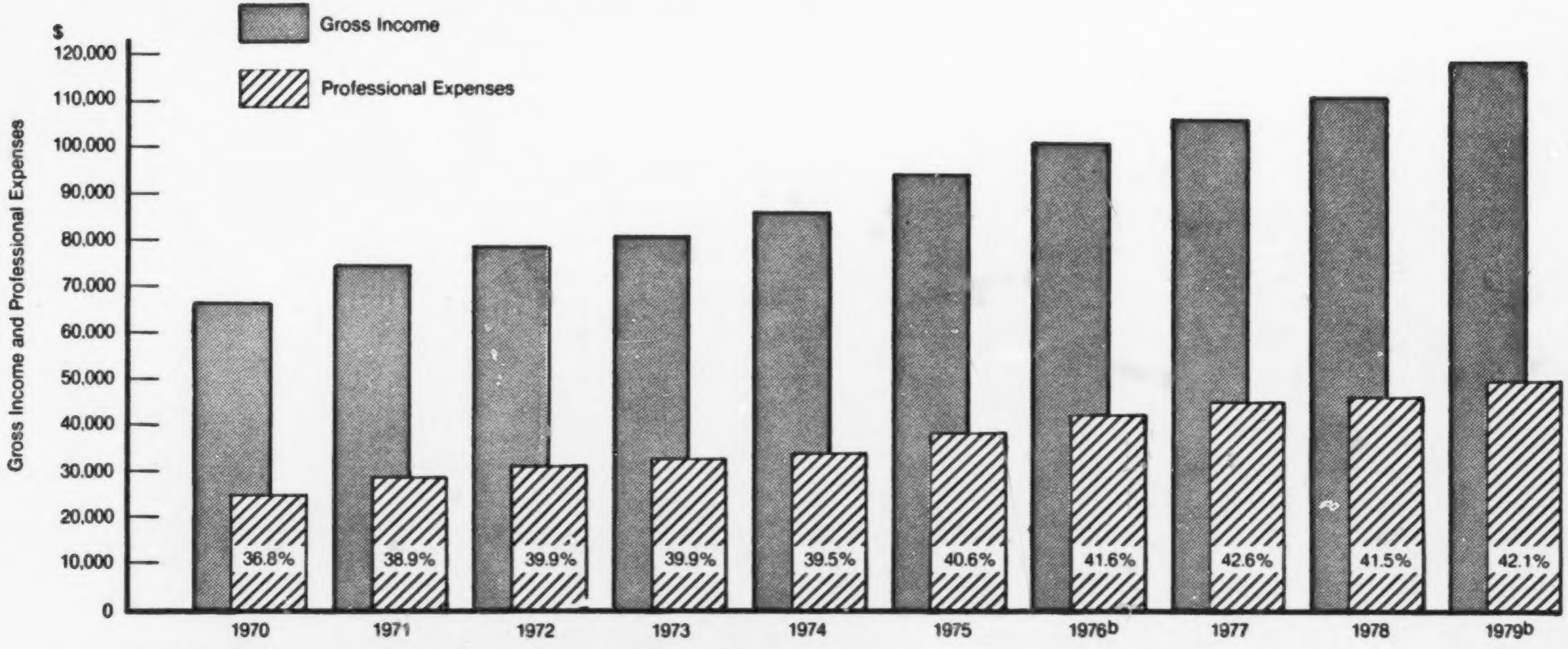
Table III—Average Tax Deductible Expenses by Specialty, 1970-1979

Specialty	1970	1971	1972	1973	1974	1975	1976[b]	1977	1978	1979[b]	Compound Percentage Growth 1970-1979
All Specialties[a]	$24,300	$28,900	$31,300	$32,200	$34,000	$38,500	$42,400	$45,500	$46,400	$49,900	8.3%
Gen. Prac.	24,200	32,100	34,500	34,000	36,700	38,600	42,400	46,100	47,800	51,600	8.8
Int. Med.	25,500	28,300	31,300	34,000	35,800	40,400	45,600	45,600	44,800	49,200	7.8
Surgery	27,100	32,900	35,800	38,000	39,300	49,100	54,800	60,400	63,400	67,500	10.7
Pediatrics	24,900	28,500	30,000	32,400	30,000	34,600	36,600	39,100	35,100	36,800	4.4
Ob./Gyn.	27,700	33,300	36,500	37,200	41,900	48,500	54,400	60,900	61,900	65,500	10.0
Psychiatry	13,300	13,000	14,100	14,300	14,000	18,700	19,800	19,300	24,200	25,600	7.5
Anesthesiology	11,200	12,700	13,900	14,000	19,300	20,000	22,200	25,900	25,300	28,000	10.7

[a] Total includes Radiology and "Other" categories. [b] Projected by physician respondents.

Source: Periodic Survey of Physicians, 1972-1979. Center for Health Services Research and Development, American Medical Association.

FIGURE 1 — Average Physician's Gross Income from Medical Practice, Average Professional Expenses, and Average Expenses as a Percentage of Gross Income, 1970-1979[a]



[a] Average Gross Income = average net income + average professional expenses;

[b] Income and expense projected by respondents for 1976 and 1979.

Source: Periodic Survey of Physicians, 1972-1979. Center for Health Services Research and Development, American Medical Association.

Over the nine-year period, the average physician's IOVF increased by 114 percent, implying an average yearly increase of 8.8 percent. Psychiatrists reported the highest IOVF for each year during the period, with physicians specializing in Internal Medicine ranked second. General practitioners consistently reported the lowest IOVF over the entire period. General practitioners' average IOVF, however, increased by an annual average of 8.9 percent, the largest increase of the specialties presented. Specialists in Obstetrics and Gynecology also averaged 8.9 percent annual increases in the initial office visit fees reported over the nine-year period. Although psychiatrists' average IOVF ranked highest among the specialties compared in Table IV, psychiatrists' IOVF grew most slowly over the period, averaging yearly increases of 6.3 percent between 1970 and 1979.

The percent increase in IOVF also differed substantially from year to year during the nine-year period. (See Table II.) The largest percentage fee increase (17.3 percent) occurred between 1975 and 1976, surpassing the 15.1 percent average increase in IOVF during 1974, the period immediately following the end of wage and price controls. Although data were not reported for 1972, between 1971 and 1973 the typical physician's IOVF rose by an average of 3.0 percent annually, the lowest annual rate over the nine-year period. These low rates reflect, in part, the impact of wage and price controls which were in effect, for physicians' fees, from August 1971 through April 1974. While data are not available for 1977, using the IOVF for 1976 and 1978 implies relatively low annual increases of 5.4 percent in both 1977 and 1978. The average initial office visit fee increased 10.4 percent between 1978 and 1979.

NET INCOMES, EXPENSES, AND FEES

The average percentage increases in physicians' average gross incomes, computed from net incomes and expenses, serves as a proxy for the percentage increase in expenditures for physicians' services. Over the nine-year period, 1970 through 1979, physicians' gross incomes increased by 6.7 percent annually.

In recent years, the annual increases in gross revenues fell below the 6.7 percent which represents the average annual increase for the nine-year period. Physicians reported an average increase in gross revenues of 4.7 percent in 1977, 4.9 percent in 1978, and 5.9 percent in 1979 (estimated). Furthermore, as noted earlier, an increasing portion of gross income consisted of professional expenses. Expenses rose to 42.1 percent of gross income in 1979, up from 36.8 percent in 1970.

Thus, assuming a constant volume of services produced per average physician over time, physicians have failed to pass the full effect of increased professional expenses on to patients in terms of increased fees.[3]

Another interesting comparison indicates that physicians' gross and net incomes have failed to increase as much as the market basket of consumer goods as measured by the Consumer Price Index (CPI). For the nine-year period the all items component of the CPI increased an average of 7.2 percent per year versus a 6.7 percent annual average increase in physicians' gross incomes and a 5.7 percent annualized increase in physicians' net incomes. This overall effect occurred most markedly in the last three years of the period. For example, in 1979 the all items index increased by 11.3 percent while physicians' estimated average gross income rose 5.9 percent and physicians' estimated average net income rose 4.7 percent.[4]

CONCLUSION

This paper has examined trends in physicians' professional incomes, expenses, and selected fees during the nine years 1970 through 1979. In this period, physicians' professional expenses experienced a greater average annualized increase (8.3 percent) than either physicians' net professional incomes (5.7 percent) or gross professional incomes (6.7 percent).

Physicians' initial office visit fees increased on average, by 8.8 percent annually, compared with a 7.2 percent average annual increase in the Consumer Price Index (CPI). The average, annualized increase in physicians' net professional incomes (5.7 percent), however failed to keep pace with the general rate of inflation as measured by the CPI (7.2 percent).

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[3] The relative increase in expenses may also be the result of changes in the definition of expenses. For example, retirement monies which are in reality deferred income may increasingly be counted as practice expenses.

[4] The 1979 increase in the all items component of the CPI was computed using mid-year 1979 and mid-year 1978 index numbers (July to July). These data more closely correspond to income and expense data which reflect the experience of an entire year. The relationship between the prices of physicians' services and general price level changes for consumer goods and services on a calendar year basis (December to December) is explored in greater detail in the AMA's "Year-End Summary CPI Report."

Female Physicians in the 1970s: Their Changing Roles in Medicine *by Lorna E. Wunderman**

INTRODUCTION

Most of the literature concerning female physicians focuses on small numbers of female doctors and/or medical students. These small-sample studies lead to conclusions which may not be representative of the total population of female physicians and medical students in this country. This paper attempts to provide a current description of women in United States medicine and notes changes which have occurred in this description over time. Finally, this report compares female physicians to their male counterparts in the areas of: specialty choice, board certification, practice mode, length of time practicing medicine, membership in the AMA, and other sociodemographic factors.

The data in this paper are extracted primarily from the American Medical Association Physician Masterfile, which is designed to provide a continuously updated census of physicians, including residents, in the United States and Possessions. Additional data concerning medical students, and previously published research findings are also incorporated.

The role of women in medicine has expanded recently, and this role promises to grow more quickly in the future. Whereas in 1963 only 6 percent of all physicians were female, in 1978 women accounted for over 10 percent of the physician population. In addition, women made up only 6.8 percent of the 1964-1965 medical school graduates, but 21.4 percent of all those graduating in 1977-1978. During this same time period, 1964 to 1978, the number of women enrolled in medical school grew from 2,503 to 14,373.

HISTORICAL PERSPECTIVE ON WOMEN IN MEDICINE

By the end of the 1800's, there were 19 U. S. Medical schools exclusively for women (Cuca 1979). Only the Women's Medical College of Pennsylvania, however, survived through the early 1900's. In 1926, 5 percent of all students entering medical school were women. This percentage changed little before the 1960's; however, in the 1964-1965 academic year, women constituted 8.9 percent of the entering class (Table I). Despite this increase, the percentage of women entering medical school remains low. The dearth of females in medicine has largely been attributed to societal views of women's roles during those years (Nemir 1978). These societal views also translated into greater financial barriers for women wishing to enter medicine, because of the greater difficulty in obtaining loans and scholarships for medical education. The Equal Opportunity Act, passed in November 1971, helped to alleviate some of the financial, educational, and social biases aimed at women.

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After the 1970 academic year, the percentage of females admitted to medical schools actually exceeded the percentage of females in the applicant pool. By 1977-1978, 25.1 percent of all applicants and 25.7 percent of all medical school entrants were women. (See Table I.) As a result of the large increase in the number of females entering medicine in the last decade, the question has been raised as to whether less qualified women are being accepted into medical schools in order to compensate for historical barriers against women. Current data on medical school applicants suggest that this is not the case.

The qualifications of male and female medical school candidates are nearly the same with respect to grade point average. (See Coordinating Council on Medical Education 1978.) Males, however, typically outscore females on the science and quantitative sections of the medical school admissions test (Medical College Admission Test 1976), and score higher on Part I of the National Board Examination (the science portion). Women, however, rated comparably with men in clinical performance (Weinberger and Rodney 1973; and Holmes, et al. 1978). Despite these facts, the percentage of females gaining acceptance out of the pool of applicants has declined somewhat since 1964. (See last column of Table I.) It has been suggested that there is a need for more female faculty to serve on admissions committees.

Faced with rejection from U. S. medical schools, male and female applicants cope with this setback differently. A study by Radius, et al. (1979), found significant differences in background, attitudes, and career outcomes of rejected applicants. One alternative for the rejected candidate is to apply for admission to a medical school outside the U. S. Data for 1978 show that 7 percent of the female physicians in the U. S. and Possessions were U. S. citizens educated in foreign medical schools (USFMGs) as compared to 6 percent of the male population. This may imply equal, if not greater commitment, by females to a medical career, even if that commitment requires studying medicine outside the U. S.

WOMEN IN THE PRACTICE OF MEDICINE

Clearly, females remain underrepresented in medicine relative to their representation in the general population. The increasing contribution of female physicians to the total supply of physicians, however, may have profound effects on health care issues in the future (i.e., the geographic and specialty distribution of physicians). The significant increases in the number of women in medicine and numerous disparities between male and female physicians in socio-demographic and professional characteristics must be considered in attempting to project future profiles in medical practice.

Age

The average female physician in 1978 was 41.9 years of age. Today, the typical female physician is younger than her predecessor (the average female physician in 1967 was 44.8 years old) and in addition, younger than her male counterpart (the average male physician in 1978 was 46.6 years old). The age of the average female declined because of the recent increases in the number of women entering medicine. Concomitantly, the male-female age differential reflects the fact that male physicians are proportionately overrepresented in the older physician population.

Geographic Characteristics

The location choices of female physicians interest policy makers concerned with the "maldistribution" of physicians. Health manpower specialists had hoped that the geographic distribution of physicians would change with the influx of females to the medical profession. Apparently, this is not the case. As of December 31, 1978, there were 45,540 federal and non-federal female physicians (including residents) in the United States and Possessions. These women locate predominately in urban areas. Of the 41,216 non-federal females in 1978, 38,216 (91.8 percent) were located in metropolitan areas, (see Table II) compared with 34,098 (91.5 percent) in 1977. This represents a 12 percent increase in the number of female physicians located in metropolitan areas in one year. By contrast, 86.4 percent of male physicians were located in metropolitan areas in 1978, up from 86.2 percent in 1977.

Females seem to follow in the paths of their male counterparts in terms of location choice. A study in North Carolina (Stern 1976), shows that the increasing supply of female physicians failed to substantially alter the geographic or specialty distribution of physicians in that state. Furthermore, in 1978, female physician-to-population ratios were greater in states with high total physician-to-population ratios, specifically Connecticut, Washington, D. C., Maryland, Vermont, Massachusetts, New York, and California. A government report (U.S. DHEW 1978) cites location of medical school as a major factor associated with a physician's choice of practice location. In support of this location theory, each of the states listed above had relatively large female enrollments in their medical schools in 1976-1977 (Groo 1977).

Specialty

The specialty distributions of male and female physicians differ significantly from one another. It has been suggested that females may be "steered" toward those specialties which are traditionally classified as "feminine fields." A study of East Coast male physicians reported that these physicians generally recommended that females enter the specialties of Child Psychiatry, Pediatrics, Anesthesiology, and Psychiatry. These doctors recommended specialties which "offer opportunities for limited time commitments and which are believed to

Table II—Non-Federal Physicians by Location of Practice and Sex, December 31, 1978

Location of Practice	Male Physicians		Female Physicians		Total Non-Federal Physicians	
	Number	Percent	Number	Percent	Number	Percent
Total Physicians[a]	366,330	100.0%	41,623	100.0%	407,953	100.0%
Metropolitan Area	316,474	86.4	38,216	91.8	354,690	86.9
Nonmetropolitan Area	49,856	13.6	3,407	8.2	53,263	13.1

[a] Total includes 26,831 Inactive and 25,553 Not Classified Physicians; total excludes 9,291 Address Unknown and 5,843 Temporary Foreign Physicians.

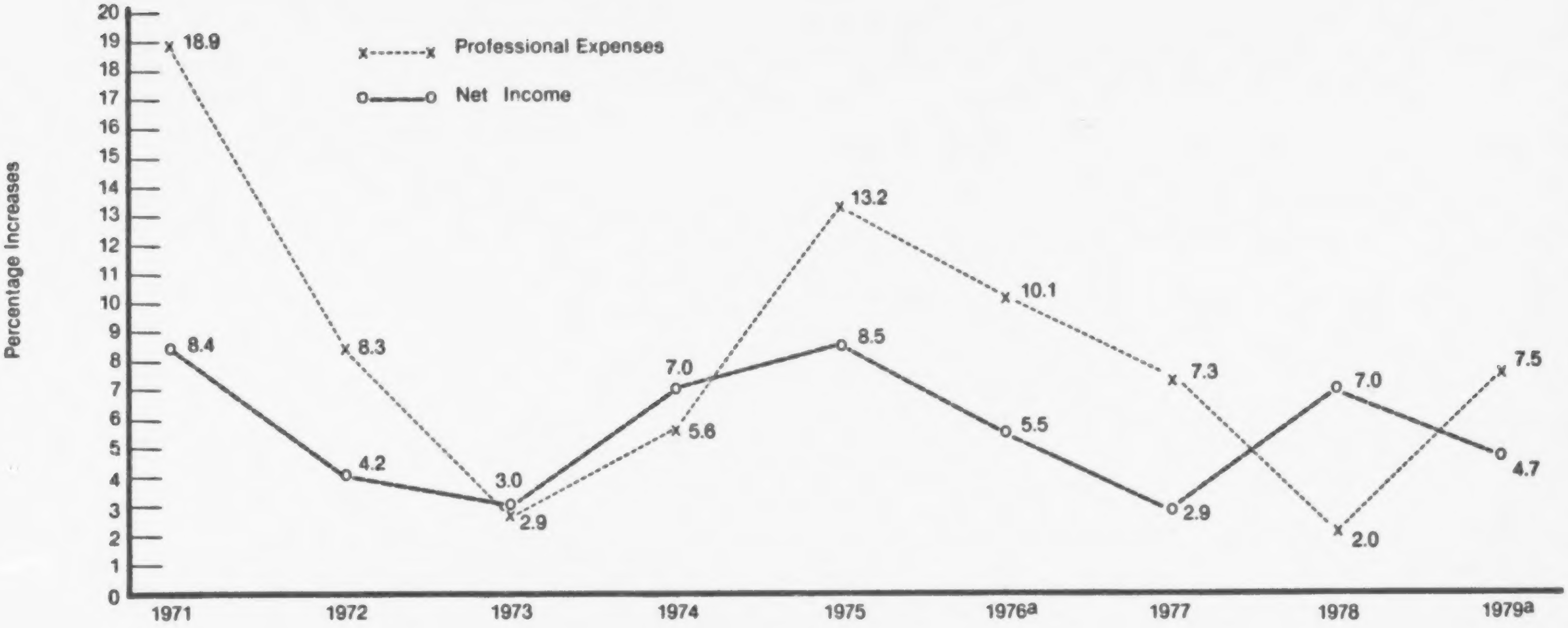
Source: AMA Physician Masterfile, 1978. Special Tabulations. Center for Health Services Research and Development, American Medical Association.

call for qualities commonly attributed to women" (Ducker 1978). Evidence that female physicians are not making the same career choices as males can be seen by examining the current specialty distribution of male and female physicians. Further, evidence that these different sets of choices are not a recent phenomenon can be seen in the overall specialty distribution of physicians. (See Tables III and IV.)

In a recent paper, Davidson (1979, p. 200) asserts that "the selection of medical specialty by women physicians-in-training is a choice by constraint." She provides three possible explanations for the large concentrations of females in certain specialties. First, certain specialties are compatible with the traditional image of females. Second, there is the issue of time demands and the dual role of the professional female (i.e., family obligations in addition to professional responsibilities). Thus, it may be asserted that women may find it difficult to train for and practice in time consuming specialties. Hence, females tend to go into specialties with limited working hours. Finally, Davidson asserts that "formal organizational structure and informal prejudicial barriers prevent women from entering the more prestigious and relatively male-exclusive specialties such as Surgery."

AMA data are largely consistent with Davidson's assertions. The

FIGURE 2 — Annual Percentage Increase in Physicians' Average Professional Net Incomes and Average Professional Expenses, 1971-1979



[a]Expense and Income data for 1976 and 1979 projected by physician respondents.

Source: Periodic Survey of Physicians, 1972-1979. Center for Health Services Research and Development, American Medical Association.

Table IV—Average Fee for Initial Office Visit by Specialty, 1970-1979[a]

Specialty	1970	1971	1973	1974	1975	1976[c]	1978	1979[c]	Compound Percentage Growth 1970-1979
All Specialties[b]	$14.23	$16.00	$16.98	$19.55	$21.20	$24.86	$27.60	$30.47	8.8%
Gen. Practice	8.46	9.65	10.74	12.03	13.11	14.80	16.55	18.21	8.9
Int. Medicine	17.81	20.38	20.51	23.11	26.11	31.27	32.53	38.18	8.8
Surgery	14.72	16.43	17.69	18.87	20.81	23.29	26.52	29.04	7.8
Pediatrics	9.95	11.18	12.20	14.49	16.18	17.45	19.03	21.06	8.7
Ob./Gynecology	14.23	17.59	19.68	22.07	23.57	27.41	29.85	30.70	8.9
Psychiatry	32.64	35.58	37.51	41.39	44.61	50.15	54.63	56.80	6.3

[a] No comparable data point is available for 1972 and 1977. [b] Total includes Radiology, Anesthesiology, and "Other" categories. [c] Projected by physician respondents.

Source: Periodic Survey of Physicians, 1972-1979. Center for Health Services Research and Development, American Medical Association.

Table I—Women in United States Medical Schools, Selected Years, 1964-1978

			Women in Medical Schools						
	Female Applicants[a]		Entering		Enrolled		Graduating		Proportion of Female Applicants Accepted
Academic Year	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	
1964-65	1,731	9.0%	786	8.9%	2,503	7.7%	503	6.8%	45%
1969-70	2,289	9.4	952	9.2	3,390	9.0	700	8.4	42
1970-71	2,734	10.9	1,256	11.1	3,894	9.6	827	9.2	46
1971-72	3,737	12.8	1,693	13.7	4,755	10.9	860	9.0	45
1972-73	5,480	15.2	2,315	16.9	6,099	12.8	924	8.9	42
1973-74	7,202	17.8	2,743	19.6	7,731	15.4[b]	1,264	11.1	38
1974-75	8,712	20.4	3,260	22.3	9,786	18.1	1,796	13.4	37
1975-76	9,575	22.6	3,656	23.8	11,527	20.5	2,200	16.2	38
1976-77	10,244	24.3	3,876	24.7	13,059	22.4	2,611	19.2	38
1977-78	10,195	25.1	4,149	25.7	14,373	23.8	3,086	21.4	41

[a] From the Association of American Medical Colleges.

[b] Harvard did not provide enrollment figures.

Source: American Medical Association. Journal of the American Medical Association 240 (December 22-29, 1978): 2823.

Table IV—Distribution of Women Physicians by Age and Specialty, December 31, 1978

	Women		Percent in Age Class		
Specialty*	Number	Percent	Less than 45	45-64	65 and Over
A	148	0.3%	0.2%	0.5%	1.0%
AM	9	0.0	0.0	0.0	0.0
AN	2,689	5.9	5.6	7.7	3.4
CD	283	0.6	0.6	0.7	0.6
CHP	935	2.1	1.7	3.1	1.9
CRS	6	0.0	0.0	0.0	0.0
D	559	1.2	1.2	1.2	1.4
DR	435	1.0	1.1	0.8	0.4
FOP	27	0.1	0.0	0.1	0.1
GE	77	0.2	0.2	0.1	0.0
GP	4,749	10.4	8.4	12.6	19.3
GPM	140	0.3	0.1	0.6	0.9
GS	1,026	2.3	3.0	1.0	0.5
IM	7,101	15.6	18.8	10.3	6.5
N	530	1.2	1.3	1.1	0.2
NS	36	0.1	0.1	0.0	0.0
OBG	2,956	6.5	6.8	5.9	6.1
OM	135	0.3	0.1	0.7	0.7
OPH	649	1.4	1.3	1.4	2.3
ORS	106	0.2	0.2	0.3	0.2
OS	1,883	4.1	1.7	5.7	17.1
OTO	120	0.3	0.2	0.2	0.5
P	4,610	10.1	8.3	14.0	12.9
PD	7,917	17.4	19.6	14.6	9.1
PDA	84	0.2	0.1	0.3	0.2
PDC	134	0.3	0.3	0.4	0.2
PH	673	1.5	0.4	3.1	5.0
PM	540	1.2	1.1	1.6	0.8
PS	95	0.2	0.2	0.2	0.1
PTH	2,616	5.7	6.3	5.5	2.6
PUD	269	0.6	0.4	0.9	1.4
R	1,002	2.2	2.4	2.1	0.8
TR	176	0.4	0.4	0.3	0.2
TS	11	10.0	0.0	0.0	0.0
U	31	0.1	0.1	0.0	0.0
US	2,783	6.1	7.7	3.0	3.3
Total	45,540	100.0	100.0	100.0	100.0

*For description of specialty codes see Appendix A.

Source: AMA Physician Masterfile, 1978. Special Tabulations. Center for Health Services Research and Development, American Medical Association.

data show that females enter residency programs associated with females and children relatively more frequently than their male colleagues. For example, in 1978, 8.3 percent of all female residents were in Obstetrics and Gynecology and 17.2 percent were in Pediatrics. Only 6.0 percent of all male residents, however, chose Obstetrics and Gynecology; another 6.0 percent chose Pediatrics. (See Table III.)

Male physicians are more heavily represented in other selected residency training positions relative to female physicians. The comparisons of the proportion of female to the proportion of male physicians in the following residency training programs illustrate this point: Neurological Surgery (0.2 percent of female residents versus 0.9 percent of male residents), Orthopedic Surgery (0.4 percent of females versus 4.0 percent of males), Thoracic Surgery (0.1 percent of females versus 0.4 percent of males) and General Surgery (5.4 percent of females versus 13.5 percent of males).

In general, the specialties selected by females for residency training have changed little in the 1970s. As of December 31, 1970, the five most popular residency specialties accounted for 64.9 percent of all female residents. The specialties included: Pediatrics (22.0 percent), Internal Medicine (14.0 percent), Psychiatry (10.6 percent), Pathology (10.5 percent), and Obstetrics and Gynecology (7.8 percent). As of December 31, 1978, these same five specialties accounted for 63.5 percent of female residents, distributed as follows: Pediatrics (17.2 percent), Internal Medicine (22.4 percent), Psychiatry (9.3 percent), Pathology (6.1 percent), and Obstetrics and Gynecology (8.3 percent). (See Table III.) By contrast, only 45.1 percent of male residents were receiving training in these five specialties as of December 31, 1978.

While examination of the distribution of physicians in residency programs provides information on the current specialty choices of women, examination of the stock of physicians provides information on the cumulative effect of past specialty choices. In 1978, although women represented only 6.5 percent of all office-based practitioners, females constituted 20.0 percent of physicians in office-based practice in Pediatrics, 14.1 percent in Pediatric Allergy, 18.9 percent in Pediatric Cardiology, 24.9 percent in Child Psychiatry, 15.3 percent in General Preventive Medicine, 17.0 percent in Physical Medicine and Rehabilitation, and 29.6 percent in Public Health (Table III).

The specialty distribution of younger female practitioners today, as compared to their older colleagues, indicates a potential trend of females entering previously male dominated specialties. The specialty practice choice of younger (18-44 years old) female physician differs from the specialty selections of middle aged (45-64) and older (greater than 65) female physicians. As seen in Table IV, the proportion of younger female physicians greatly exceeds the proportion of middle aged and older female physicians for certain specialties. For example, pediatricians represent 19.6 percent of the younger female physician population but only 14.6 percent of middle aged and 9.1 percent of the older female physician population. Similar percentage increases exist for younger female physicians specializing in Pathology, Internal Medicine, Neurology, and General Surgery.

On the other hand, some specialties have witnessed a decline in the age-specific proportion of female physicians. For example, female physicians whose specialty is Public Health represent a 0.4 percent of the younger female physician population but represent 3.1 percent of the middle aged and 5.0 percent of the older female physician population.

Board Certification

There are significant differences in the achievement of specialty board certification by male and female physicians, as well.[1] Only 38.4 percent of the female physician population not currently in a residency program held a specialty board certificate as of December 31, 1978. In contrast, 57.0 percent of the male physicians held at least one board certificate. Furthermore, only 1.1 percent of the females, as compared to 2.7 percent of the males, held two boards.

It must be considered, however, that females may hold proportionately fewer board certificates, in part, because they enter specialties that have not offered certification programs or specialties in which a relatively smaller percentage of physicians are certified.

Practice Type

Compared to their male colleagues, proportionately fewer female patient-care physicians practiced medicine in an office-based setting. Almost half (48.9 percent) of the 31,892 female physicians involved in patient-care activities in 1978 were in office-based practice, compared to nearly three quarters (72.2 percent) of the 310,822 males in patient-care activities (Table V). Hospital-based practice accounted for the remaining 16,307 (51.1 percent) females in patient-care with 10,480 of these in residency programs and 5,827 full-time hospital staff positions. The remaining 86,541 (27.8 percent) male physicians in patient-care were in hospital-based practice, including 50,130 residents and 36,411 full-time hospital staff.

Additionally, in 1978, 3,586 female physicians (7.9 percent) were engaged in Other Professional Activities such as medical teaching (900), administration, (1,113), research (1,216) and other (357). Similarly, 29,511 male physicians (7.5 percent) were engaged primarily in Other Professional Activities such as medical teaching (6,125), administration (10,745), research (10,221) and other (2,420).

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[1] All residents have been excluded from these data because they are not eligible for board certification until completion of residency.

Professional Activity Levels

Female physicians, perhaps because of their multiple societal demands, have interruptions in their careers more frequently than men, although the frequency and duration of these career breaks have diminished in recent years (Mandelbaum 1979). In 1970, 12.3 percent of the 25,401 female physicians were inactive as compared with 8.0 percent of 45,540 in 1978. A physician on the AMA Physician Masterfile is considered "inactive" if he/she is retired, semi-retired, disabled, or temporarily not in practice and works less than 20 hours per week.

As seen in Table VI, the proportion of physicians classified as inactive varies dramatically by age of physician. The proportion of female physicians classified as inactive exceeds the proportion of inactive male physicians. This relation is especially predominant for physicians under age 55. However, these numbers may fail to indicate reduced levels of activity by female physicians as measured by reduced hours of work. (See Bobula 1980.)

Other Professional Factors

Numerous other differences between male and female physicians have been cited in literature. Females tend to practice fewer weeks per year and fewer hours per week than males (Kehrer 1976). Bobula (1980) reports lower total net income and lower income per hour for female physicians as compared to males.

Also, other factors associated with women physicians receive increasing attention as the number of females in a traditionally male dominated field increases. The deficiency in role models for female medical students and the career-family conflict may exacerbate certain stresses for female physicians. The suicide rate for female physicians is greater than for their male counterparts, and greater than the general female population. This is particularly true for female physicians under age 45 (Steppacher and Mausner 1974). The divorce rate is higher for female physicians than for other females in "traditional relationships," however, it parallels the divorce rate for dual career families (Rosow and Rose 1972).

Another area where male and female physicians differ markedly is American Medical Association (AMA) membership. Membership in the AMA is considered an indicator of peer group relationships and implies conformance to established medical traditions and standards (Freshnock and Goodman 1979). Only 24.7 percent (11,263) of the total number of women physicians belonged to the AMA as of December 31, 1978, as compared to 47.4 percent (185,711) of the male physician population. However, there are 8,414 members (3,914 physicians and 4,500 student members) of the American Medical Women's Association (AMWA) which might contribute to the lower membership rate in the AMA for females.

Table V—Distribution of Physicians by Major Professional Activity and Sex, December 31, 1978

Activity	Male	Female
Total Physicians*	391,946	45,540
Total Patient Care	310,822	31,892
Office-Based Practice	224,281	15,585
Hospital-Based Practice		
Residents	50,130	10,480
Full-Time Staff	36,411	5,827
Other Professional Activity		
Medical Teaching	6,125	900
Administration	10,745	1,113
Research	10,221	1,216
Other	2,420	357
Inactive	23,186	3,645
Not Classified	21,355	4,198
Address Unknown	7,072	2,129

*Excludes 5,259 male and 584 female temporary foreign physicians.

Source: AMA Physician Masterfile, 1978. Special Tabulations. Center for Health Services Research and Development, American Medical Association.

Table VI—Distribution of Inactive Male and Female Physicians by Age, December 31, 1978

	Inactive Physicians*	
Age Category	Male (Percentage)	Female (Percentage)
Under 35	0.1%	0.8%
35-44	0.4	3.7
45-54	0.9	6.0
55-64	3.9	12.3
65 and Over	35.7	49.6
All Ages	5.9	8.0

*These percentages indicate the proportion of male or female physicians out of each age category who were inactive as of December 31, 1978.

Source: AMA Physician Masterfile, 1978. Special Tabulations. Center for Health Services Research and Development, American Medical Association.

SUMMARY

Male and female medical school applicants have similar qualifications when competing for positions. Once they have completed their undergraduate education, however, major differences in career patterns emerge. Specifically, major differences were noted in their average ages, specialty distribution, board certification, practice mode, membership in the AMA, and psychological factors (i.e., suicide and divorce rates).

Although these differences exist, societal attitudes concerning the roles of women have changed dramatically in the last decade as exemplified by the increased numbers of females in medical school. Furthermore, specialty trends indicate that women are entering previously exclusively male specialties such as Surgery.

Appendix A

Description of Specialty Codes

GENERAL PRACTICE

GP	General Practice and Family Practice

MEDICAL SPECIALTIES

A	Allergy
CD	Cardiovascular Disease
D	Dermatology
GE	Gastroenterology
IM	Internal Medicine
PD	Pediatrics
PDA	Pediatric Allergy
PDC	Pediatric Cardiology
PUD	Pulmonary Disease

SURGICAL SPECIALTIES

GS	General Surgery
NS	Neurological Surgery
OBG	Obstetrics and Gynecology
OPH	Ophthalmology
ORS	Orthopedic Surgery
OTO	Otolaryngology
PS	Plastic Surgery
CRS	Colon and Rectal Surgery
TS	Thoracic Surgery
U	Urology

OTHER SPECIALTIES

AM	Aerospace Medicine
AN	Anesthesiology
CHP	Child Psychiatry
DR	Diagnostic Radiology
FOP	Forensic Pathology
N	Neurology
OM	Occupational Medicine
P	Psychiatry
PTH	Pathology
PM	Physical Medicine and Rehabilitation
GPM	General Preventive Medicine
PH	Public Health
R	Radiology
TR	Therapeutic Radiology
OS	Other Specialty
US	Unspecified

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Geographic Mobility of Physicians: 1971-1975

*by Steven R. Steiber**

INTRODUCTION

Between 1971 and 1975, 15.1 percent of the non-resident[1] physicians in the United States moved their professional activity from one county to another. This represents a total of 37,052 moves, in a professional population usually characterized as infrequent movers (DHEW 1978; Wunderman 1979). Annualized, this rate indicates that approximately 3.6 percent of physicians moved per year.

This study uses data from the year-end AMA Physician Masterfiles. The location of the professional activity of individual physicians is observed in 1971 and again 1975 to highlight general patterns of physician geographic mobility across the United States. Examination of specific census divisions from which, and to which physicians moved in this period suggest which areas of the U. S. were most able and which were least able to attract physicians. Identification of characteristics of the "typical mover" as well as the "typical stayer" may help detail probable causes for migration and suggest impacts these moves may have on health care delivery in the United States.

RELATED RESEARCH

The mobility of physicians is not a new area of medical research. Within this broad context, however, there have emerged two relatively distinct bodies of literature shaped largely by the limitations of available data. Researchers examining aggregate level data have described the existing location patterns of physicians and/or physician practices across states and census divisions (Rimlinger and Steele 1963; Steele and Rimlinger 1965; Benham, et al. 1965; Reskin and Campbell 1974; Goodman, et al. 1977; Way 1978). Studies focusing on the individual physician have primarily sought to identify some of the determinants of location decisions of recent medical school graduates (Yett and Sloan 1974; Heald, et al. 1974; Werner, et al. 1979).

Neither of the above approaches, however, has been able to specifically follow the geographic mobility of non-resident physicians. Examinations of the aggregate data indicate net migrations, that is, the final outcome of the physician moves, but not the pattern of these moves. Furthermore, these studies of aggregate data do not distin-

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[1] The reader should note that the physicians on which this analysis is based have completed their residency training prior to 1971. They are therefore termed "non-resident physicians" in this paper.

Table III—Distribution of Resident and Office-Based Physicians by Specialty and Sex, December 31, 1978

	Resident Physicians				Office-Based Physicians					
	Males		Females		Males		Females			Percent
Specialty*	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Total	Women
	50,130	100.0%	10,480	100.0%	224,281	100.0%	15,585	100.0%	239,866	6.5%
A	-	-	-	-	1,278	0.6	105	0.7	1,383	7.6
AM	45	.1	2	0.0	192	0.1	3	0.0	195	1.5
AN	1,356	2.7	289	2.8	8,564	3.8	1,210	7.8	9,774	12.4
CD	-	-	-	-	6,047	2.7	141	0.9	6,188	2.3
CHP	145	2.9	82	0.8	1,304	0.6	432	2.8	1.736	24.9
CRS	23	0.0	1	0.0	611	0.3	5	0.0	616	0.8
D	504	1.0	108	1.0	3,585	1.6	317	2.0	3,902	8.1
DR	759	1.5	101	1.0	3,142	1.4	155	1.0	3,297	4.7
FOP	7	0.0	0	0.0	98	0.0	12	0.1	110	10.9
GE	-	-	-	-	2,337	1.0	42	0.3	2,379	1.8
GP	4,922	9.8	882	8.4	43,121	19.2	2,287	14.7	45,408	5.0
GPM	52	0.1	12	0.1	200	0.1	36	0.2	236	15.3
GS	6,752	13.5	567	5.4	20,243	9.0	179	1.1	20,422	0.9
IM	12,898	25.7	2,346	22.4	31,799	14.2	1,973	12.7	33,772	5.8
N	855	1.7	136	1.3	2,368	1.1	185	1.2	2,553	7.2
NS	461	0.9	18	0.2	2,221	1.0	8	0.1	2,229	0.4
OBG	3,014	6.0	874	8.3	16,284	7.3	1,233	7.9	17,517	7.0
OM	15	0.0	1	0.0	1,523	0.7	65	0.4	1,588	4.1
OPH	1,231	2.5	156	1.5	9,309	4.2	294	1.9	9,603	3.1

(continued on following page)

Table III—Continued

	Resident Physicians				Office-Based Physicians					
	Males		Female		Males		Females			
Specialty	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Total	Percent Women
ORS	1,996	4.0	46	0.4	9,325	4.2	30	0.2	9,355	0.3
OS	-	-	-	-	4,527	2.0	396	2.5	4,923	8.0
OTO	743	1.5	42	0.4	4,680	2.1	41	0.3	4,727	0.9
P	2,561	5.1	972	9.3	12,506	5.6	1,669	10.7	14,175	11.8
PD	3,022	6.0	1,805	17.2	11,909	5.3	2,970	19.1	14,879	20.0
PDA	10	0.0	2	0.0	292	0.1	48	0.3	340	14.1
PDC	18	0.0	6	0.1	245	0.1	57	0.4	302	18.9
PH	30	0.1	4	0.0	345	0.2	145	0.9	490	29.6
PM	179	0.4	96	0.9	661	0.3	135	0.9	796	17.0
PS	314	0.6	21	0.2	2,031	0.9	57	0.4	2,088	2.7
PTH	1,627	3.2	638	6.1	4,460	2.0	567	3.6	5,027	11.3
PUD	-	-	-	-	1,639	0.7	76	0.5	1,715	4.4
R	1,195	2.4	227	2.2	6,936	3.1	325	2.1	7,261	4.5
TR	149	0.3	50	0.5	805	0.4	61	0.4	866	7.0
TS	200	0.4	6	0.1	1,479	0.7	1	0.0	1,480	0.1
U	907	1.8	13	0.1	5,601	2.5	8	0.1	5,609	0.1
US	4,140	8.3	977	9.3	2,614	1.2	317	2.0	2,931	10.8

*For description of specialty codes see Appendix A.

Source: AMA Physician Masterfile, 1978. Special Tabulations. Center for Health Services Research and Development, American Medical Association.

guish non-resident physicians from physicians still in their residencies. The second approach (which has focused exclusively on recent medical graduates and their first positions), by definition, ignores the moves of those physicians already in practice.

PHYSICIAN MIGRATION STREAMS

The physician populations referenced in this article represent absolute numbers moving into and from designated areas of the United States. The reader must bear in mind that when physicians move from an area, this does not necessarily result in a loss of medical care to the indigenous population. Where the general population's migrations parallel those of physicians, a status quo in the provision of care will be maintained, other things being equal. Moreover, new physicians just completing their residencies may be moving to some areas as replacements for those who have left.

The population of non-resident physicians on which Figure 1 is based includes only those MDs who are actively engaged in medicine. It excludes temporary foreign, unclassified, and deceased (between 1971 and 1975) physicians and physicians for whom location information was unavailable. The relative width and directions of the arrows in the figure show the major net migration streams of physicians across census divisions of the United States between 1971 and 1975. These net streams are derived by computing the total number of physicians migrating from one area to another and subtracting those migratating in the opposite direction.

The directions of the arrows here reflect the culmination of a large scale historical trend in the population migrations of the United States. Earlier migrants in this century (circa 1930s) moved primarily out of the deep South and into the urban Northeast, the North Central states, and to a lesser degree, to California and the Western states (Shryock 1964). More recently, however, there has evolved a trend characterized by demographers as a Frost Belt/Sun Belt migration. The migrations to Western states have increased, and they have been supplemented by a distinct reversal of the earlier pattern of population loss by the South Atlantic Seaboard and the Gulf states (Eldridge and Kim 1968).

Physicians, either because they are following the civilian population, or because they too seek the warmer climates of the Southern states, also display the Frost Belt/Sun Belt migration characteristics. This point is further underscored by examining the net migrations across census divisions. Those divisions which have a net loss of the greatest number of practicing physicians are the West North Central (335), the East North Central (637), and the Middle Atlantic (2151). On the other hand, the Mountain (636), the South Atlantic (1033), and the Pacific (1250) divisions, received the largest net gain. The remaining divisions have experienced only nominal changes in the net number of physicians crossing their boundaries.

Recent data from the Physician Placement Service (PPS) of the

American Medical Association show that the net donor regions generally have the largest number of advertised job openings for physicians.[2] The three census divisions recently advertising the greatest number of positions for physicians are the East North Central, the West North Central, and the West South Central. The advertised openings for physicians within these areas account for a combined total of 51.6 percent of all positions advertised with the PPS as of January 1979 (McLean and Polli 1979). The potential problems of areas experiencing net losses of physicians concommitant with population growth may be further exacerbated by the failure of new physicians to locate in these areas. Indeed, unpublished AMA data indicate that "new physicians" may be migrating, in greater numbers, in the same direction as non-resident physicians.

TYPICAL MOVERS AND STAYERS

Examination of the total number of physicians moving from, and staying in specific locations, while suggestive of the overall availability of medical care in the U. S., does not tell the whole story. One can reasonably expect, for instance, that physicians' specialties, types of practice, and type of employment will be important in assessing the extent to which health needs (especially primary health care needs) of a locale may be met. Likewise, other professional and personal characteristics mediate the impact that larger demographic trends have on health care delivery.

Table I presents selected professional characteristics of typical movers versus typical stayers. In addition to the absolute numbers of movers or stayers who may be described by the selected characteristics, this table presents the percentages that these numbers represent of the total mover or stayer population.[3] For example, in Panel 1, of Table I, 28,211 or 76.1 percent of physician movers may be classified as involved in direct patient care. Of the 208,304 physicians who stayed in their original county of medical practice between 1971 and 1975, 184,715 or 88.7 percent were engaged in direct patient care.

The practice mode of the majority of both movers and stayers is direct patient care. The actual percentages which these numbers represent, however, show that proportionally fewer of the mover population are in direct patient care. Instead, medical administrators, researchers, or teachers are relatively overrepresented in the mover

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[2] The Physician Placement Service seeks to facilitate "physician placement by acting as an information broker between physicians seeking new professional positions and individuals . . . who are seeking a physician. The primary mechanism used to bring these two groups together is a series of quarterly publications called Registers, one which includes brief physician resumes . . . and one which includes brief opportunity listings" (McLean and Polli 1979:53).

[3] In Table I and Table II, the percentages across rows will be different for nearly all variables under consideration. Inasmuch as a total population of physicians is represented by these percentages, all such differences are statistically significant. The less substantial of these percents, however, may be less noteworthy, especially where there are missing data.

Table I—Professional Characteristics of Physician Movers and Stayers, 1971-1975[a]

Professional Characteristic	Movers		Stayers	
	Number	%	Number	%
Total Physicians	37,072		208,304	
1. Type of Practice (1971):				
Direct Patient Care	28,211	(76.1)	184,715	(88.7)
Administration	2,707	(7.3)	8,244	(4.0)
Research	2,576	(6.9)	7,218	(3.5)
Teaching	1,140	(2.1)	4,400	(2.1)
Other	2,438	(6.6)	3,727	(7.8)
2. Physician Specialty (1971):				
Primary Patient Care	16,069	(43.3)	107,510	(51.6)
Internal Medicine	6,980	(18.8)	36,291	(17.4)
Pediatrics	2,386	(6.4)	12,453	6.0)
Obstetrics-Gynecology	1,966	(5.3)	13,960	(6.7)
General Practice	4,737	(12.8)	44,806	(21.5)
Non-Primary Care	21,003	(56.7)	100,794	(48.4)
Surgery	6,926	(18.7)	45,680	(21.9)
Psychiatry	3,918	(10.6)	15,568	(7.5)
Radiology	2,177	(5.9)	8,822	(4.2)
Anesthesiology	1,781	(4.8)	7,768	(3.7)
Other[b]	6,201	(16.7)	22,956	(11.0)
3. Employment Status (1971):				
Non-Federal Employment	20,898	(56.4)	180,415	(86.6)
Federal Employment	11,017	(29.7)	19,238	(9.2)
Other, Unknown Employment	5,157	(13.9)	8,651	(4.2)

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[a] Total population bases for Movers and Stayers are the same as those in Figure 1.

[b] "Other" is the residual category of the American Medical Association's nine category physician specialty code. For a detailed list of contents of the nine specialty groups see Characteristics of Medical Practice, in this volume.

category. This distribution of physician movers is not unexpected considering that the costs involved in disrupting and reestablishing professional practices are cited as principal reasons for the relatively low mobility of the physician population. Physicians in administration, research, or teaching are expected to be more mobile, following patterns which more closely resemble academically employed colleagues in other sciences.

Supporting the general patterns observed by type of practice, are those frequencies presented by specialty in Panel 2, Table I. Physician specialty choice may, to a certain extent, also suggest the type of practice setting in which the physician will work. Those physicians who must, of necessity, invest the most time and energy in developing a clientele are those who will be least likely to move. Most notable among these non-moving physicians are those in General or Family Practice. Of the nine specialty classes, general and family practitioners are the most underrepresented in the mover population. Specifically, 44,806 or 21.5 percent, of the stayers are in general practice, whereas only 4,737 or 12.8 percent of the movers are in this category.

Although the relative numbers of physicians engaged in general or family practice who move or stay suggest a simple distinction between those engaged in primary care versus those in non-primary care, there exists noteworthy exceptions. Internists and pediatricians, usually classified as primary care physicians, are proportionally more represented in the mover than in the stayer populations. These exceptions notwithstanding, however, as a group, primary patient care practitioners tend to be proportionally overrepresented in the "stayer" category, and underrepresented in the "mover" category.

Finally, Panel 3 in Table I shows the extent to which one may relate mobility of physicians to federal employment status. Physicians employed by the federal government need not establish a clientele or build a facility; both are supplied by the employer regardless of medical specialty. Therefore, federally employed physicians contribute disproportionately to the population of physician movers.

Professional or practice characteristics offer some explanation of the processes by which physicians decide to move or stay. Mutual selection, however, may also contribute to the observed relationships, that is, physicians who might already be inclined to migrate may select professional avenues more consonant with this goal. Likewise, the demands of certain professional positions would be such that the physician is required to move in order to advance (e.g., research or federal employment). Other characteristics, however, may also have a hand in the process.

Characteristics of the locale in which a physician establishes a practice or assumes a professional position may influence whether a physician will remain in, or leave the area. Panels 1 and 2 of Table II suggest a likely pattern of mobility across urban areas.

Table II—Other Selected Characteristics of Physician Movers and Stayers, 1971-1975[a]

Selected Characteristic	Movers		Stayers	
	Number	%	Number	%
1. Location of Practice by Demographic County Classification (1971):				
Non-metropolitan	5,376	(14.6)	30,508	(14.8)
Less than 10,000	392	(1.1)	1,583	(0.8)
10,000-24,000	1,084	(2.9)	6,580	(3.2)
25,00-49,000	1,687	(4.6)	10,130	(4.9)
50,000 +	2,213	(6.0)	12,215	(5.9)
Metropolitan	31,438	(85.4)	175,689	(85.2)
Potential SMSA	1,114	(3.0)	7,513	(3.6)
50,000-499,999	5,627	(15.2)	34,952	(17.0)
500,000-999,999	4,068	(11.1)	27,899	(13.5)
1 - 4,999,999	14,090	(38.3)	69,140	(33.5)
5,000,000 +	6,539	(17.8)	36,185	(17.5)
2. Location of Practice by Demographic County Classification (1975):				
Non-metropolitan	6,234	(16.9)	28,376	(13.8)
Less than 10,000	348	(0.9)	1,465	(0.7)
10,000-24,000	1,229	(3.3)	6,175	(3.0)
25,000-49,999	2,078	(5.6)	9,515	(4.6)
50,000 +	2,579	(7.0)	11,221	(5.4)
Metropolitan	30,632	(83.1)	177,622	(86.2)
Potential SMSA	807	(2.2)	4,121	(2.0)
50,000-499,999	7,222	(19.6)	37,323	(18.1)
500,000-999,999	4,528	(12.3)	28,055	(13.6)
1,000,000-4,999,999	14,250	(38.7)	74,230	(36.0)
5,000,000 +	3,825	(10.4)	33,893	(16.5)
3. Physician Age Categories (1971):				
Less than 40 years	19,952	(53.8)	48,914	(23.5)
40-65 years	14,613	(39.4)	139,186	(66.8)
More than 65 years	2,507	(6.8)	20,204	(9.7)
Median Age	42		51	
4. Physician Sex (1971):				
Female	2,927	(7.9)	12,634	(6.1)
Male	34,145	(92.1)	195,670	(93.9)

[a] Total population bases for Movers and Stayers are the same as those in Figure 1; total populations, may not be equal across all variables where missing data exist.

The Demographic County Classification[4] used to create the categories in Panels 1 and 2 of Table II is described in detail elsewhere (Department of Statistical Analysis 1979). The general gradient, however, is from relatively smaller counties to larger, more metropolitan ones. Over time, one can expect most urban areas to grow. Thus, over the period 1971 to 1975, a physician may not have actually relocated but may have changed demographic classification status. This would occur if the population of the county in which the physician practiced grew sufficiently to be reclassified. Very generally, physician stayers are reclassified across years into urban categories somewhat larger than those in which they were placed in the first year by the mere growth of these areas (see Table II).[5] The classification of movers and stayers, therefore, cannot be compared directly across years. At any given time, however, the relative distribution of stayers provides a useful standard for comparison with the mover population's distribution.

In both years, the relative distribution of the movers maintains a close correspondence to that of the stayers with the major exceptions of the 50,000-499,999 and the 5,000,000-plus population categories. Between 1971 and 1975, the percentages of movers located in these smaller urban areas increased from 15.2 percent to 19.6 percent. Conversely, the proportion of the mover population located in the largest urban areas decreased from 17.8 percent to 10.4 percent. Many of those who move, then, originate in the largest metropolitan areas of ther United States, and come to reside in appreciably smaller metropolitan areas. Additionally, the larger distinction between metropolitan and non-metropolitan locations shows a shift to the latter among movers. Both of these observations are consistent with the regional net migration streams of physicians reported in Figure 1. The Sun Belt (as a receiving region) simply has fewer larger-sized metropolitan areas than the Frost Belt (as a donor region). Of necessity, physicians moving to the Sun Belt between 1971 and 1975 generally moved to smaller population centers. With the passage of time, however, this may change as the total United States population redistributes itself across these regions.

In Panel 3, Table II, a collapsed age distribution of movers and stayers is consonant with demographers' findings for the larger population. This is, migrants are generally younger than non-migrants (comparing percentage distributions and median ages within mover and stayer physician populations). The longer a physician stays in an area, the greater is his/her investment in terms of acquiring an office, purchasing equipment and/or building a professional reputation and professional relations. These professional practice-related costs of a move add to the housing and family considerations which the physician shares with the larger population. Additionally, first positions which physicians assume after completion of the residency may not be those in which they may wish to invest an entire career. Subsequent choices and associated moves, however, may bring the physician closer to a "best position" and, therefore, reduce the likelihood of additional moves.

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[4] The Demographic County Classification categories are based on Sales and Marketing Management estimates of county population coupled with U. S. Census Bureau criteria for defining Standard Metropolitan Statistical Areas. The categories are mutually exclusive but do not necessarily form a population continuum. See Department of Statistical Analysis (1979, pp. 42-44) for further explanation of this coding scheme.

[5] The actual change in the distribution of counties across this Demographic County Classification is such that there are no changes in the absolute numbers of the two largest metropolitan categories but the smaller categories decrease in number between 1971 and 1975 and the medium size counties increase (Roback 1972; Goodman 1976).

Finally, females are proportionately more represented in the mover than in the stayer population. (Panel 4 of Table II.) Historically, women have been conspicuously absent from the physician population. Even today, there are far fewer female than male physicians. Across categories of movers and stayers, however, one finds that movers have a proportionately greater number of women in their ranks than the stayers. Women's increasing admissions into medical schools in recent years generates an age distribution among women physicians that is increasingly younger than that of men. Women physicians because they are on average younger, may be more likely to move by virture of their age alone. Among married women physicians, there may also be a greater inclination to follow the husband in his moves.

SUMMARY AND DISCUSSION

Physicians changing their counties of practice location between 1971 and 1975 totaled approximately 37,052 or 15.1 percent of the physician population analyzed. The geographic pattern described by demographers as a Frost Belt/Sun Belt migration applies to physicians who relocate. Physicians are leaving the West North Central, the East North Central, and the Middle Atlantic census divisions of the United States in greatest numbers. Their destinations are disproportionately in the Mountain, South Atlantic, and Pacific divisions.

In general terms, the typical physician stayer is in direct patient care, primary care, and is self-employed or employed by a non-federal agency or institution. The majority of these stayers, as is the case with the majority of the civilian population, may be found in the larger urban centers of the United States. The median age of the stayers is about 51 years. There are disproportionately more men than women among the stayers than among the movers.

The typical physician mover, on the other hand, is not so heavily represented in direct patient care and is instead proportionally more likely to be involved in medical administration, research, or teaching. Movers also are found more often in non-primary care specialties than in primary care. A substantial proportion of the movers are locating in middle-sized metropolitan and small areas, leaving the very large urban centers. Proportionally more movers versus stayers are employed by the federal government. The median age of the mover population is 42 years, and proportionately, women are slightly more represented within their ranks than within the stayers' ranks.

The migration of established physicians from the Northern areas to the Southern areas of the United States raises important questions. These migrating physicians are disproportionately involved in non-primary care specialties, and this pattern may be a critical concern to the recipient regions. There is also an added influx of the civilian population in this same direction. One may ask, therefore, whether there will be a shortage of primary care practitioners in these areas unless recipient regions begin to produce more primary care physicians from their indigenous medical training programs.

Although unique information on the overall migrations of non-resident physicians may be gleaned from this presentation, no firm conclusions may be drawn regarding the development of medical shortage areas, per se. As suggested in the text, a number of additional factors must be known before the "equity" of the physician distribution may be determined. The specialty, practice type, and characteristics of the associated civilian populations of specific areas are just a few of these factors.

There are, at present, governmental efforts to define medical "shortage" areas in the United States and to develop programs designed to more "equitably" distribute medical manpower. Such efforts increasingly may represent barriers to the migration decisions of some physicians. Legal barriers to physician migration are not an explicit consideration in the above analysis, nor are they a critical component of an analysis during the time frame under study. Further analyses of subsequent periods, however, will find it necessary to account for barriers such as state licensure requirements and/or quotas, as well as non-reciprocal state licensure of physicians. Dentists already face far less licensure reciprocity across states than do physicians.

Further analyses of physician mobility patterns are warranted in order to identify additional implications for health care delivery in the United States. First, a complementary analysis of placement patterns of physicians leaving residencies for first positions during the same time frame as this study would seem advisable. This analysis should provide insight into the effects new physicians have, either amplifying or dampening the effects of the migration patterns exhibited by established physicians. If both new and established physicians manifest similar geographic gradients, dramatic increases in health care "shortage areas" in the years to come may result.

A second line of study would include statistically more rigorous analyses of the possible determinants of physicians' moves. Identifying characteristics of physicians and/or target areas which conjointly (instead of the single variable approach above) determine physicians' decisions to stay or move may prove most useful in identifying the mechanisms underlying the development of these "shortage areas."

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Part III—Health Services Research and Policy Analysis: Selected Papers

The four articles in this section provide research and policy analyses concerning health care delivery systems. These papers were selected because of their relevance to major societal and health care policy issues of the 1970s, and their potential relevance for the 1980s. These issues include: health care cost escalation and cost containment; the increased reliance on technology in medical practice and the impact of technology on costs; and the changing roles of women in our society in general and in medical care in particular.

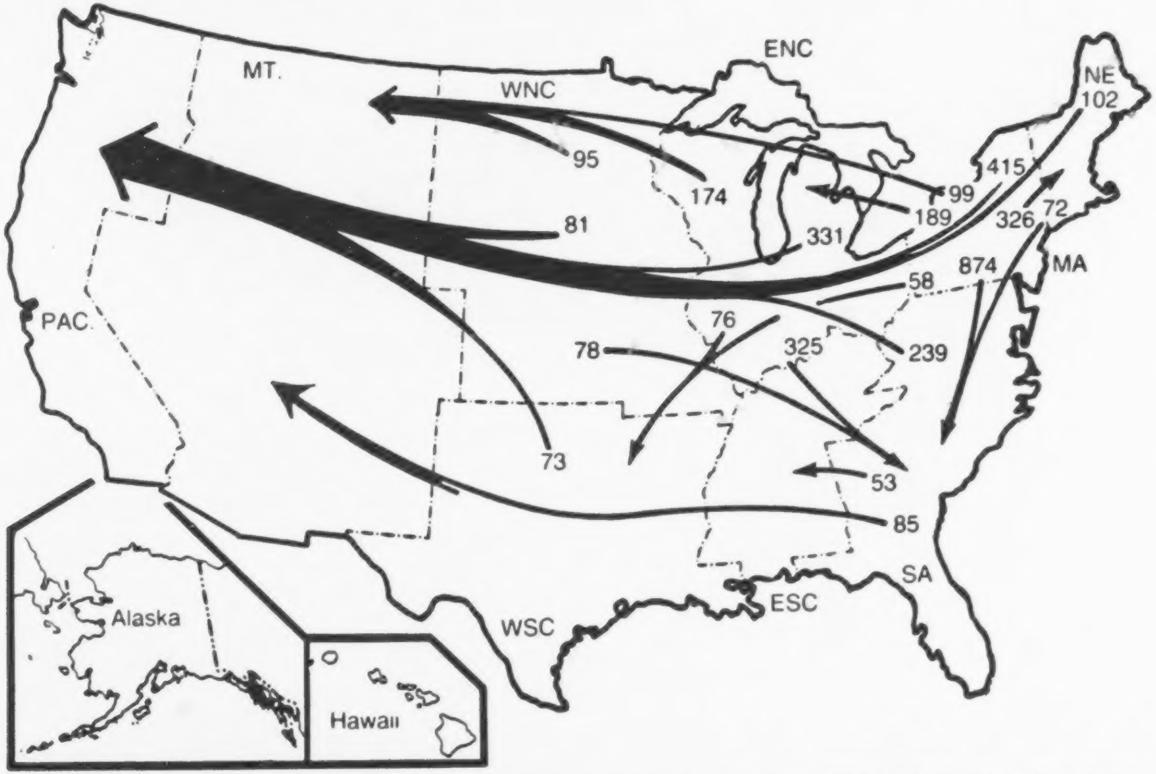
"Regulation of Hospital Costs, Volume and Prices" by John D. Thompson examines various federal and state efforts at hospital cost containment. Thompson focuses on the conceptual foundation of an innovative hospital reimbursement system based on Diagnosis Related Groups (DRGs) currently being implemented in New Jersey.

As director of Health Economics Research Services, the New Jersey Hospital Association, Paul L. Grimaldi questions the "Equity and Efficiency Implications of Case-Mix Reimbursement in New Jersey." This analysis details the operational aspects of the DRG-based reimbursement system as it is being implemented in one state.

Discussions of health care costs, and in particular hospital costs generally site the growth of technology as a possible contributing factor. Philip G. Cotterill provides an analytic review of the literature on "The Impact of Technology on Health Care Costs.

The past decade witnessed changes not only in the technological inputs, but also the human inputs in the production of medical care services. Specifically, the percentage of women in the physician population grew markedly in the 1970s, and is expected to grow even more dramatically in the 1980s. Joel D. Bobula examines this in "Income Differences Between Male and Female Physicians."

Figure 1—Major Net Physician Migration Streams Among United States Census Divisions, 1971-1975[a]


MT.
WNC
ENC
NE
102
95
174
99
415
189
326
72
81
331
874
MA
58
PAC
76
325
239
78
73
53
85
SA
ESC
WSC
Alaska
Hawaii

[a] Migration streams are based on the total established (non-resident) physician population in 1971 excluding inactive, temporary foreign, unclassified, and deceased physicians, and physicians for whom data were unavailable. Also, only net migration streams of more than fifty physicians are presented in this figure.

Regulation of Hospital Costs, Volume and Prices

*by John D. Thompson**

INTRODUCTION

The evident demise of the federal administration's second attempt to enact hospital cost-control legislation was characterized as a serious blow to general inflation control efforts, and hospital cost-control efforts in particular. Although a postmortem may be appropriate for this specific approach to cost containment, such an examination would not reveal the variety of federal and approximately 18 state level hospital cost-containment programs presently operating.

The exclusion of these ongoing state and federal efforts from discussion of hospital cost-regulation reflects confusion over their objectives—confusion which may be due to the multiple definitions of the word "cost." This paper will define "cost" and its major components, and will analyze existing and proposed hospital cost-control strategies in terms of this definition. Particular attention will be paid to an innovative, case-related prospective reimbursement mechanism presently being instituted in New Jersey. This system links levels of hospital reimbursement to the volume of patients treated in each of 383 diagnosis-related groups (DRGs).

DEFINITION OF HOSPITAL COSTS

Cost is not an easy word to define with precision, according to Thompson (1968), even without the adjective "reasonable" appearing before it. Costs are spoken of in at least two ways—first, what it costs the hospitals to produce a unit of service, and second, what it costs an individual or third-party payor to buy that unit of service. Further, vagueness is intensified when one uses terms such as "room rates" or "charges" as opposed to "special service costs" or "ancillary costs," however defined.

Any consideration of cost regulation, then, must specify the aspect of expenditures which one is attempting to influence, that is, unit production costs, unit prices, or total expenditures for hospital care. Public regulators and third-party payors should be concerned with a similar measure of cost—the total cost of hospital care incurred per thousand of a defined population. From government's perspective, this population consists of the total number of people in a state, region, or area. From a third-party payor's purview (private or public), the population is the number of people eligible for reimbursement of certain kinds of services, i.e., those who are enrolled in an insurance plan or those eligible for Medicare and Medicaid. For this paper, cost is defined as total expenditures per unit of population. Once this is accepted, the various approaches to, and aspects of, "cost regulation" can be understood a little more clearly.

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VOLUME AND PRICE

If we consider the ultimate target of cost regulation to be included in the equation, Volume x Price = Total Cost, where total cost and volume are expressed per unit of population, then we may classify cost-containment programs according to whether they focus on total cost or volume and/or price.

It has been a matter of debate for some time whether the escalation of hospital costs should be attacked on the volume side or on the price side. As early as 1965, control of volume was attempted through 1) Regional Medical Planning (RMP) and, 2) Utilization Review (UR). On the subject of these control mechanisms, in an early analysis of the "reasonable cost of hospital services," Thompson noted that "these two attacks, therefore, consider hospital costs not as the price of a unit of service, but as the cost of decreased units of service per unit of population served. This may be the only way to assure the delivery of hospital services at a reasonable cost" (Thompson 1968, p. 49).

Current federal programs explicitly concerned with controlling hospital costs include Public Law 92-603 (setting up the Professional Standards Review Organizations, PSROs), Public Law 93-641 (the National Health Planning and Resources Development Act of 1974) now revised as Public Law 96-79, and the Health Maintenance Organization Act, revised as Public Law 94-460. These three pieces of federal legislation are often overlooked when hospital cost-containment programs are enumerated, perhaps because all three deal primarily with the volume side of the total cost equation.

This failure to regard these three pieces of legislation as cost-control programs is not due to the lack of clarity in their mandated functions. Supporting the PSRO legislation, Senator Wallace F. Bennett stated to the Senate on September 27, 1972: "The PSRO Amendment represents the best and, perhaps, the last opportunity to fully safeguard the public concern with respect to the cost and quality of medical care . . ." (Gosfield 1975, p. 109). The charge within Public Law 93-641 is equally explicit. Under the functions of Health Systems Agencies set up by the law, Section 1513 (a) states that the health systems agencies are being founded for the purpose of "restraining increases in the cost of providing them [residents of a health services area] health services." The Health Maintenance Organization (HMO) legislation, while focusing on issues of maldistribution of health practitioners, nevertheless prescribes in Section 110.406 of the Interim Regulations of June 8, 1977, that one of the considerations of an award is that the HMO be judged on ". . . the effectiveness the proposed organization may reasonably be expected to have in reducing inappropriate hospital utilization, containing health care costs . . ." (U. S. DHEW 1977).

Total hospital expenditures reflect two contributing factors, price and volume. Similarly, total volume expressed in "hospital days per thousand population" is the product of two commonly used indicators "admissions per thousand" and "average length of stay" (LOS). The three existing pieces of federal legislation directly or indirectly attempt to constrain admissions per thousand and LOS. Therefore, to the extent these legislated activities are effective, hospital days per thousand will be constrained.

The PSRO legislation provides the most direct approach to control of hospital days per thousand. PSROs have the power to review both "appropriateness of admission" and "length of stay." The planning legislation attacks the problem a little differently by having inherent in its planning approach the minimization of the assumed effect of Roemer's Law. This law can be stated as ". . . one of the most powerful indications for an admission to a hospital is the presence of an empty hospital bed" (Roemer and Shain 1969). Public Law 93-641, then, by attempting to control the supply of hospital beds, hopes to decrease admissions to those beds.

The enactment of HMO legislation, in part, may be attributed to the research finding that patients receiving care in prepaid group practice plans used approximately 20 to 30 percent fewer hospital days per thousand enrollees than did patients who utilized the fee-for-service method of payment, whether these fees were paid by insurance or out of pocket. Recent research seems to indicate that the main factor accounting for this difference in hospital days is admissions per thousand rather than variations in lengths of stay (U. S. DHEW 1975).

The various state hospital cost-control programs, on the other hand, tend to be concerned mainly with the price factor in the total cost equation. The specific target of various state programs includes price-per-case (New Jersey) and per diem prices derived directly or from reviews of total hospital income or expense budgets for a given period of time (Connecticut, Washington). With one or two notable exceptions (Maryland and New York), the volume problem is not directly addressed. (See Thompson 1977.)

The interrelationship of price and volume is clearly illustrated in the Connecticut experience with cost regulation. In 1974, the Connecticut Commission on Hospitals and Health Care began regulating per diem charges based on the approved net revenue budgets of all the hospitals in the state. However, by 1976 substantial revenue was being generated above the approved budgeted level. This excess revenue was due to volume increases, primarily in the volume of ancillary services used per patient day. In assessing the five-year experience with the cost commission in Connecticut, Tilson (1979) states that "hospital rates have had a modest increase in recent years, not substantially out of line with the cost of living. What has gone up and what has caused concern is the total volume of health services." This evidence points out that concern about prices without an equal concern for volume will result in "ineffective" hospital cost-control programs.

The most notable example of a state or local attempt to control both volume and costs is the Rochester, New York Maxicap experiment. The New York program establishes a community-wide budget for all hospital care within the 11-county region. Setting a dollar "cap" for the costs of hospital care must result in efforts to control both volume and price.

The New Jersey experiment considers diagnosis-related groups as the reimbursement unit. Hospital reimbursement under this program reflects an expected volume of services within each DRG and a predetermined reimbursement for treating a case in a given diagnosis-related group. Thus, incentives exist for the control of both lengths-of-stay and the price of those lengths-of-stay charged by the hospitals.

A complicating factor in the control of both volume and price is the unassailable fact that hospitals do not admit, treat, or discharge patients—doctors do. Physicians' decisions concerning admissions, patterns of treatment, and the timing for discharge of patients greatly influence the volume factor in hospital costs. Hospital administrators can, however, through various management techniques, influence the efficiency with which the services ordered by the doctor are delivered. For example, flexible hospital staffing patterns result in a closer relationship between labor costs and the actual volume of services in the hospital. The final decision, however, influencing where and how patients are treated, the volume of services delivered to patients, and the lengths-of-stay lie in the hands of the medical staff. This is not to indicate that these decisions are arbitrary or capricious. Indeed, the DRG system is based on the concept that these decisions result in a predictable pattern and a relatively homogeneous distribution of resource use related to the patient's primary diagnosis, presence of selected secondary diagnoses, presence of selected surgical procedures, and patient age.

What this means, then, is that any program aimed at de-escalating hospital costs in this country must control both the volume and price factors, and must involve physicians, hospital boards, and administrators if there is to be any real effect on long-term or short-term costs.

The DRG model being used in New Jersey rests on findings that variations in costs of care across hospitals can be linked to three sources: 1) different hospitals treat different patient mixes; 2) physicians in hospitals treat similar patients somewhat differently; and 3) some hospitals perform their delivery functions more efficiently than others (Thompson and Fetter 1979). Until regulation of hospital costs disentangles these three factors in an understandable fashion, the control of hospital costs cannot be understood, let alone achieved.

COSTS AND QUALITY OF CARE

One factor which has not yet been discussed in this paper is the relationship of costs to quality. It is not held that this relationship is insignificant, and it is covered in the second of the cost variance producing factors mentioned above, i.e., physicians treat patients somewhat differently from one hospital to another. Anyone who says there is no relationship between cost and quality is unknowing, if not naive. The cost/quality curve is a well-known principle of production management (Fetter 1967) and is based on three assumptions: 1) there is an accepted and acceptable level of quality; 2) costs are known precisely; and 3) quality can be measured with equal precision.

The main problem with applying this cost/quality curve to hospital care is the insistence in public policy statements that hospitals are to offer the "highest" quality of care at "reasonable" cost. Neither of these two terms are defined in any quantitative way. Nor, at the present state of the art, could they be. The cost-quality conundrum exists because no one really knows how to measure hospital costs very precisely, let alone the marginal increase in costs which would occur as a result of marginal increases in quality. Despite these problems, any reimbursement system must contain some method of relating cost to quality, however imprecise the measurement of those terms at the present time. Precision can only be improved through the use of a system, generating feedback for refining these measures. Unless the interrelationship of cost and quality is continuously examined, better understanding cannot be obtained.

THE NEW JERSEY EXPERIMENT

It is because of the necessity to relate volume to price, the need for a framework within which physicians and administrators can address their interrelated objectives, and the need for a common unit of service which will allow the development of future cost/quality measurements, that the DRG experiment in New Jersey may well serve as a model for cost containment of the future.

The New Jersey experiment selects as the prospectively determined reimbursement unit a description of the total treatment of the patient, who is categorized as belonging to one of 383 diagnosis related groups. Thus, the hospital is considered to be a multi-product firm producing 383 products, i.e., patient treatment episodes. This system provides the hospital and, indirectly, the physician with incentives to produce these products (treated patients) as efficiently as possible, because the reimbursement formula rewards such efficiency. In this sense, efficiency is defined as treating similar classes of patients within a shorter length of stay or with fewer ancillary services.

Although a prospectively determined reimbursement rate is the main feature of the program, another important feature may be that it gives both the medical staff and administration a better picture of the specific resources used for the treatment of various kinds of patients. Clearly, the data necessary to implement this reimbursement system may have substantial potential for use in internal management and control systems (Thompson and Fetter 1979). Comparative studies between hospitals can examine the differences in such resource use based on differences in case mix (as specified by the 383 DRGs) or on differences in treating similar patients over time. This system allows documentation and examination of the exact mix of patients, the patterns of care and the way each one of these patient groups is treated in terms of resource use. Moreover, within each hospital, volume and price variations can be examined at the DRG level to determine the effect on hospital resources and costs resulting from a shift over time in DRG mix. An example of such a shift might be a decrease in normal deliveries and a relative increase in caesarean sections.

Once a DRG system is in place and patterns of resource use are examined, the data can be used for conducting process-based, diagnosis-specific reviews of medical care quality. More importantly, such an approach mandates the joint examination of these data by the medical staff and administration. It does the administrator very little good to examine these data without the cooperation and expertise of the medical staff. In turn, the medical staff can begin to understand the relationship of their patterns of practice to hospital costs in terms that are more relevant to them, i.e., case-related treatment costs, rather than traditionally used cost measures, such as, cost per nursing day or cost per pound of laundry.

THE RELATIONSHIPS AMONG VOLUME, PRICE, AND COST

The formula used at the beginning of this article to define hospital costs, Volume x Price = Total Cost, ignores possible interrelationships between price and volume. From a review of the literature on the regulation of volume, it seems that three cost-containment strategies may directly or indirectly influence the prices of hospital services. These strategies are: 1) the transfer of the treatment of selected diagnoses from an inpatient to an outpatient mode; 2) the transfer of selected services, now available primarily to inpatients, to ambulatory care settings; and 3) decreasing admissions to, or shortening the lengths of stay of patients treated in hospitals. Each of these strategies will affect hospital prices in different ways. Furthermore, the saving of a hospital day does not necessarily result in saving of the average cost of that day.

The usual explanation for the above statement is the problem of the different effects of changes in volume on fixed and variable costs. There are few more frustrating areas of inquiry than the attempt to isolate the fixed and variable aspects of costs within a hospital. One characteristic of such costs is that the ratio of fixed to variable costs is different from department to department within a hospital. Because patients in each diagnosis-related group use a different mix of hospital services, treatment of each DRG may have different proportions of fixed and variable costs. It is quite likely, then, that the overall ratio of fixed to variable costs in a hospital will shift as the volume of specific services changes, and as the kinds of patients admitted varies (Thompson, et al. 1979).

Without attempting to quantify its effects on fixed and variable costs, an example of the first cost-containment strategy, transferring treatment from an inpatient to outpatient mode, is the growth of ambulatory surgery. Fewer groups of surgical patients, as defined by certain DRGs, will be admitted to hospitals, but will be treated outside the hospital or within a special section of it. These primarily short-stay patients whose per diem price may be high, but whose total case price is low, will have an effect on the overall pricing pattern of the hospital.

The next strategy being considered to cut down the use of hospital days is the provision of certain services on an ambulatory basis. Preadmission testing to reduce preoperative days exemplifies this strategy. Performing many of the diagnostic tests which usually occur during the first day or two of hospitalization on an outpatient basis will mean that the inpatient hospital bill will not reflect the price of these tests. The effect of this change in procedure on overall hospital prices depends on where these tests are performed. If they are performed within the hospital where the admission is to take place, there would be no change in ancillary service volume, and therefore, no expected change in prices. If, however, these procedures are carried out in an independent laboratory, doctor's office, or HMO, the reduction in volume would certainly affect the hospital's ancillary service pricing. One cannot determine, in other words, the exact effect on hospital prices of such a strategy.

Finally, the effect on prices of the third approach—attempting to decrease days of care per thousand by reducing admissions and/or average length of stay—is far more interesting and complex. Reductions in the aggregate measure, hospital days of care per thousand population, may mask increases in either average LOS or admissions per thousand. The fact that this is occurring is evident in Health Care Financing Administration data entitled "Hospital Based Measures of Short-Stay Hospital Use Adjusted for Patient Origin for Medicare Beneficiaries Aged 65 and Over by PSRO Area, State, and Region, 1974-1977" (U. S. DHEW 1979). These data point out that within the over-65 age group there has been a 6.1 percent increase in discharges per thousand enrollees over the four-year period but a 0.3 percent decrease in days of care per thousand enrollees due to a 6.0 percent decrease in the average length of stay. Over the four-year period, annual average days of care per thousand decreased by 110 days.

The national data reveal, then, that the decline of 110 days in the annual measure of hospital days of care per thousand Medicare beneficiaries, during the four-year period, occurred concomittantly with an increase of 20 admissions per thousand beneficiaries. The cost implications of this are rather complex. One could hypothesize that mainly room-and-board costs were saved, since they correlate more closely with length of stay than do ancillary services costs. This saving may have been at the price of an aggregate increase in ancillary services, since every admission entails a minimum diagnostic workup and many require, in addition, other special services, such as operating room, recovery room, radio-therapy, etc. A preliminary report of one hospital's savings realized by shortening the length of stay in three DRGs pointed out that savings vary between medical and surgical diagnoses and between the long-term and short-term view. In no instance did the savings approach the average cost per day (Leary 1979).

The only system now operative which can deal with the complex interrelationship between the volume and price of services is the DRG system. Although this system does not provide a methodology for determination of fixed and variable costs, a rigorous examination of such a ratio is the next logical step if DRGs are to achieve maximum potential both as a reimbursement and management control tool.

CONCLUSIONS

It is in the light of these observations, that the diagnosis-related group approach to hospital cost containment should be examined. The important line of assessment is whether or not such a system can provide a greater understanding of the relationship between volume and price and the effect of both on population-based costs. At the same time, the interrelationships between physicians' decisions and the decisions of the hospitals' boards and hospitals' administrators must be clarified. Volume control and price regulation are only mutually reinforcing when they are considered together by those responsible for overseeing each of the factors.

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Equity and Efficiency Implications of Case-Mix Reimbursement in New Jersey *by Paul L. Grimaldi**

INTRODUCTION

Escalating hospital expenditures have generated a nationwide search for a reimbursement method that would fairly compensate hospitals yet slow the growth of expenditures. Many hospitals have been paid on a per diem basis for various inpatient services. The per diem usually covers room and board, nursing care, and varying amounts of other services. Separate charges are levied for ancillary services, and special diagnostic and therapeutic items not covered by the per diem. Also, different per diems are often charged to different payors and the per diems for insured patients are usually calculated retrospectively.

To stem expenditure increases, especially those attributable to Medicaid patients, many states have implemented a rate review program designed to control hospital reimbursement rates, charges, or costs.[1] A handful of states presently mandate the setting of per diem rates for certain classes of payors, usually Medicaid and/or Blue Cross patients (American Hospital Association 1979; U. S. DHEW 1978). A fairly common element of the mandatory programs is that reimbursement rates are set prospectively—before services are rendered—rather than retrospectively. A prospective method is more likely to contain costs because it places specific limits on reimbursable expenditures before services are rendered, whereas a retrospective method is open-ended and the amount paid is determined after patients are treated.

After briefly addressing equity and efficiency goals of rate-setting agencies, this paper explains the case-mix reimbursement method recently implemented by the New Jersey State Department of Health (NJDOH). The major focus of this paper is the components of and assumptions behind the calculation of payment rates under this new approach to hospital reimbursement. The analysis of the calculation is followed by a discussion of some of the implications of case-mix reimbursement for hospital administration.

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[1] Mandatory rate-setting programs typically require uniform cost reporting. Inpatient costs are reported by department and are separated from outpatient costs. Hospitals are usually grouped by teaching status, bed size, or location. Per diem costs are calculated for individual departments or clusters of departments, and screens (ceilings) are placed on the maximum amount reimbursed for each group. Hospitals are paid the lower of actual cost or the screened amount.

EQUITY AND EFFICIENCY

A rate-setting program should establish payment rates that are equitable and reasonably related to the cost of providing patients with necessary, quality care. This is easier said than done because of the absence of widely accepted criteria of fairness and reasonableness. Should hospitals be paid all the costs they incur in treating patients? If limits are to be set on reimbursable costs, how should they be calculated and how high should they be placed? Also, would limits adversely affect quality? In practice, answers to these questions generally vary by state and are embodied in the rate-setting procedures which attempt to contain hospital costs and reimbursement. These procedures have elicited numerous criticisms, particularly from the hospital industry. One frequently heard complaint is that contemporary rate-setting methods pay inadequate attention to the fact that different hospitals treat patients with widely different medical needs (Evans 1971; Lave, et al. 1972; Luke 1979; Zaretsky 1977). The failure to make sufficient allowances for case-mix may result in hospitals being underpaid or overpaid for services rendered. Critics have proposed, therefore, that reimbursement be linked directly to the type of patients or cases treated.

A rate-setting method should also promote efficiency in the production of quality hospital care. Efficiency relates to whether the rate-setting method encourages hospitals to produce targeted health outcomes with the least costly combination of medical, nursing, and other inputs (Griffin 1979). Hospitals are said to function inefficiently whenever unnecessary resources are used to treat patients. Per diem methods may encourage hospitals to render a service as long as additional service revenue exceeds additional service costs. This economic incentive prevails regardless of the contribution any particular service or day of hospital care makes toward the targeted health outcome. Consequently, certain inpatients may stay longer than necessary, certain persons who could be treated as outpatients may be treated as inpatients, and certain patients may receive excessive ancillary services.

In contrast, a prospective case-mix method, that pays a fixed amount for treating any patient in a diagnostic group, provides hospitals with a financial incentive to weigh carefully the contribution each service makes toward the targeted outcome. In other words, since the rate is fixed—and rate setters may permit hospitals to retain all or part of the difference between the rate paid and actual costs incurred—hospitals are encouraged to provide services that are expected to impact most positively on health status for each dollar expended. Similarly, hospitals are encouraged to minimize length of stay and also to substitute outpatient care for inpatient care (Worthington 1977).

DESCRIPTION OF NEW JERSEY RATE SETTING METHODS

Since the mid-Seventies, the New Jersey State Department of Health has administered a mandatory hospital per diem rate setting program known as SHARE (Standard Hospital Accounting and Rate Evaluation). In 1976, NJDOH launched an experiment to develop and implement a prospective case-mix approach to hospital reimbursement (Reiss 1980; New Jersey State Department of Health 1979). Two years later, the State legislature enacted Senate Bill 446, which mandated a major revamping of hospital reimbursement, including specific recognition of the effect of case-mix on hospital costs (New Jersey Hospital Association 1979a).[2]

The newly mandated approach differs from SHARE in several important respects. First, the SHARE per diem method has been replaced by payment rates that depend upon the cost of treating specific cases or patients; these case-mix rates are the same regardless of the length of time most patients are hospitalized. Second, whereas SHARE sets payment rates for inpatient services received by Blue Cross and Medicaid patients, the new approach applies to all payors and all outpatient services. In short, the State now has control over all charges for inpatient and outpatient care. This control is expected to reduce cross-subsidization between payors and across services. Under SHARE, hospitals usually charge higher prices to patients for whom rates were not set, especially when Medicaid and other payors paid less than full cost. The new method requires all payors to pay essentially the same price for the same services.

The new program broadens the definition of reimbursable cost to include expenses that were previously not reimbursable. The major item is uncompensated care, which consists of bad debts and the cost of providing services to indigent patients who do not have public or private health insurance. Previously, the cost of uncompensated care may not have been recovered fully because it was not chargeable to all payors, such as Medicaid or Medicare. Now, the cost of uncompensated care will spread proportionately across all patients. Another item, previously not reimbursable, is price-level depreciation expense for major movable equipment. Under the old program, the depreciation expense was based entirely on historical cost; under the new program, the depreciation is adjusted for inflation. Also, at the outset of the new program, an additional amount will be paid to hospitals deemed to have an unsatisfactory working capital position. This payment was not available under SHARE.

Twenty-six of the 116 New Jersey hospitals received case-mix payment rates in January 1980. Ten of these hospitals volunteered largely because of the new reimbursable elements of cost. The other sixteen hospitals were chosen by the State's Health Commissioner. The remaining 90 hospitals are scheduled to be phased into the new program by 1983.

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[2] This paper focuses on hospital inpatients. Outpatients are divided into seven groups and payment rates are established in a manner roughly similar to inpatient rates. The seven outpatient groups are clinic, home health, emergency, outpatient dialysis, ambulatory surgery, same-day psychiatry, and privately referred.

Determining Case-Mix

Under an ideal case-mix method a different payment rate would be established for each patient, since rarely will two patients consume identical resources. In practical terms, however, a patient-specific method might be very costly for rate setters to monitor. Furthermore, the estimated cost of treating patients may be very unreliable at such a fine level of disaggregation. Hence, a case-mix approach must necessarily classify patients into an "optimal" number of groups, that is, a number that is large enough to avoid masking differences in resource consumption, yet small enough to be administrable and to allow reliable estimation of costs.

How is resource consumption to be determined? In classifying patients into "medically meaningful and readily identifiable homogeneous groups," the New Jersey approach assumes that the type and the quantity of resources consumed vary directly with the length of a patient's stay. Initially, all discharged patients are divided into 83 exhaustive, non-overlapping Major Diagnostic Categories (MDCs) that are reportedly consistent in the way patients are managed medically. Subsequently, patients within these MDCs are partitioned into 383 Diagnosis Related Groups (DRGs) according to whether their primary and secondary diagnoses, age, and/or surgical procedures were found to significantly alter length of stay.[3] Patients with atypically long or short lengths of stay (outliers) are isolated statistically and handled separately. The number of DRGs differs within each MDC. MDC 66 (Arthritis), for example, contains five DRGs, whereas MDC 26 (Acute Myocardial Infarction) contains only one. (For additional information on the formation of DRGs, see Mills, et al. 1976; Fetter, et al. 1977.)

Computation of DRG Payment Rates—Overview

Under the recently implemented New Jersey method, a particular hospital must charge all patients in a DRG essentially the same rate. These rates vary by DRG and by hospital. Actual costs for a base year, adjusted for estimated hospital-specific price increases, are used to calculate payment rates for the rate year. For example, payment rates for rate year 1980 are based upon base year 1978 costs. At the end of the rate year, settlements are made for misprojections.

DRG payment rates can be divided into two parts. The first consists of the amount paid for direct patient care—physician, nursing, and diagnostic and therapeutic ancillary services. With certain exceptions, this amount is intended to cover the variable (versus fixed) portion of the cost of direct patient care. The statistical procedure used to estimate the cost of providing services to individual patients employs numerous utilization ratios that allocate departmental costs to each DRG, and then divides direct patient-care costs by the number of cases in each DRG to obtain the cost per patient. To illustrate, if historically patients in DRG A generated 15 percent of all laboratory charges, then 15 percent of the laboratory department's variable costs is allocated to this DRG. If total variable laboratory costs equaled $200,000 and there were 400 patients in DRG A, the laboratory cost per patient in DRG A would be $75, [(0.15) ($200,000)/400].

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[3] The data base used to determine the number of DRGs contained about 500,000 hospital records from all New Jersey hospitals, 150,000 records from one Connecticut hospital, and 52,000 records from 50 hospitals in a PSRO region. However, a detailed audit conducted by the Health Research & Educational Trust of New Jersey under contract to the State Department of Health found that of 50 randomly selected inpatients in each of 50 New Jersey hospitals, 26.4 percent of patients were assigned to the wrong DRG. It is noteworthy that the State Department of Health unit responsible for data analysis finds this error rate unacceptable, even though DRG payment rates are based on these abstracts.

The focus on direct patient-care costs represents a regulatory attempt at marginal cost pricing—setting the price of each additional unit of output at its cost. The New Jersey method actually relies on average marginal cost pricing, something common in regulated industries. In other words, the method assumes that the additional cost of treating the 100th patient is the same as the additional cost of the 300th patient. This assumption is generally acceptable when the costs of treating individual patients are tightly clustered (roughly the same). Otherwise, the average is an inadequate indicator of the marginal cost of an additional patient.

The second part of the DRG payment rate is the amount paid for overhead, property, and all other reimbursable costs. The overhead portion of this component includes such items as utilities, education, administration, and malpractice insurance. This component is tested for reasonableness and reimbursed up to a prescribed ceiling. This prospectively determined amount is considered fixed for the rate year and is reimbursed regardless of the amount spent, and regardless of any change in the number and type of patients treated. Similarly, property costs and other items comprising this component are essentially treated as fixed and reimbursement is guaranteed.

A "gross up" procedure is used to determine a full DRG payment rate. Each DRG payment rate for direct patient care in 1980 is multiplied by the estimated number of cases for that DRG to obtain the hospital's total reimbursable cost of direct patient care (TDC). Next, this total is added to the total of fixed costs (TF), and the sum, TDC + TF, is divided by total direct patient care cost to obtain a "gross up" factor or multiplier. Finally, each DRG payment rate for direct patient care is multiplied by this factor so that total reimbursement covers all reimbursable fixed and variable costs of providing services. Thus, if for all DRGs the factor equals two [(TDC + TF)/TDC = 2], all payment rates for direct patient-care are doubled, which means that each dollar of direct patient-care cost gets reimbursed an extra dollar to cover all other costs. Retrospective adjustments are made for overpayments or underpayments that may occur during the rate year.

Determination of Payment Rates for Direct Patient Care

Precisely how is the prospective payment rate for direct patient care determined? This rate equals the sum of the cost of hospital-based physician services plus a weighted average of the other variable direct patient-care costs. Payment for hospital-based physician services (PMD) depends entirely upon base-year costs incurred by individual hospitals. Payment for the remaining costs of direct patient care equals the weighted combination of a hospital's own average non-physician cost ($\overline{PO}$) for patients in a DRG plus a standard non-physician cost ($\overline{PS}$) for all patients in the same DRG. The standard cost equals the average of non-physician, direct patient-care costs for a given DRG for hospitals participating in the new system. $\overline{PS}$ is adjusted for intrastate differences in hourly labor costs. The weights, WO for $\overline{PO}$ and WS for $\overline{PS}$, depend upon the dispersion of costs around the average for treating the patients in a DRG. The greater the dispersion, the greater the emphasis placed on the individual hospital's own costs and the less on the standard, and vice-versa.

The case-mix reimbursement rate for direct patient care (DC) can be summarized algebraically as:

$$DC = PMD + WS\ (\overline{PS}) + WO\ (\overline{PO}).$$

The weight (WS) for the standard equals half the difference between one and the coefficient of variation. A higher coefficient of variation indicates greater variation of the costs of individual cases in a DRG from the average cost for that DRG. The coefficient of variation for each DRG is calculated by dividing the standard deviation of the cost per case by the average cost of the cases in a DRG, inclusive of an adjustment for differences in intrastate labor costs.

$$WS = 0.5\ (1 - \text{coefficient of variation}).$$

The weight (WO) for a hospital's own cost may be expressed as:

$$WO = 0.5\ (1 + \text{coefficient of variation}).$$

Table I illustrates the calculation of the weights for four hypothetical DRGs. The examples show that as the coefficient of variation increases, a hospital's own cost plays a more important role in determining its payment rates. If the coefficient exceeds 0.99, the payment rate is based entirely on the hospital's own cost. If the coefficient is zero, the payment rate equals 50 percent of a hospital's own cost and 50 percent of the standard.

WS and WO for each DRG depend upon the cost of treating patients in the hospitals participating in the rate setting program and are applied to each hospital. A separate set of weights and payment rates are calculated for teaching and non-teaching hospitals.

The following example helps to clarify the calculation of the payment rate for direct patient care (New Jersey Hospital Association 1979b). Assume a hospital averages \$700 in non-physician costs ($\overline{PO}$) to treat patients in a given DRG and \$200 in physician costs (PMD) for a total of \$900. Also, assume that for this DRG the standard for

Table I—Weights for Hypothetical DRGs

DRG	Coefficient of Variation (After Adjustment for Labor Costs)	Weight (WO) for Individual Hospital Costs[a]	Weight (WS) for Standard Cost[b]
A	0.00	0.500	0.500
B	0.45	0.725	0.275
C	0.95	0.975	0.025
D	1.68	1.000[c]	0.000

[a] WO = 0.5(1 + coefficient of variation).

[b] WS = 0.5(1 - coefficient of variation).

[c] See text.

non-physician costs ($\overline{PS}$) is \$500. If the coefficient of variation is 0.70, WO equals 0.85 and WS equals 0.15. The hospital, therefore, receives \$870 for this case [DC = \$200 + 0.85 (\$700) + 0.15 (\$500)]. If, however, the hospital's average cost was \$300, the payment rate would be \$530 [(DC = \$200 + 0.85 (\$300) + 0.15 (\$500)]. In the first part of this example, the hospital lost \$30 (\$900 - \$870) for treating a patient in this DRG, since the hospital's cost of treatment exceeded the payment rate. In the second part, the hospital's reimbursement exceeded its cost by \$30 (\$530 - \$500).

If all the costs incurred in treating patients were fully reimbursable, hospitals would have little incentive to minimize cost. Similarly, if hospitals were not permitted to keep the difference between a prospectively-determined rate and actual costs, they would have little incentive to keep costs below the approved rate. The DRG method encourages hospital administrators to minimize costs by setting payment rates prospectively and simultaneously permitting them to retain the difference between a fixed payment rate and the actual cost in the rate year.

ANALYSIS OF THE PRICING MECHANISM

The New Jersey case-mix method assumes that the DRGs are homogeneous, consisting of patients who consume similar hospital resources. Homogeneity within the DRGs is a prerequisite for payment rates to reasonably approximate marginal costs—and for interhospital case-mix adjusted cost comparisons to yield reliable results. If DRGs are truly homogeneous, the observed differences in the cost per case between hospitals may be attributable to methodological flaws in the DRG rate-setting model, variations in efficiency and/or differences in medical practice. For example, doctors may differ in their application of cost effectiveness principles, or may substitute hospital resources (such as nurses) for their own time whenever possible in order to maximize their own income or other objectives (Pauly and Redisch 1973). Physicians may also differ in their diagnostic acumen just as administrators may differ in their ability to manage hospital resources directly under their control. If, however, the DRGs are not truly homogeneous, interhospital cost differences may reflect valid differences in patients' use of resources.

The coefficients of variation that are used to compute the payment rates constitute one possible indicator of the homogeneity of the DRGs. Other things equal, the smaller the coefficient of variation for a DRG, the greater the likelihood patients will consume similar resources. Frequently, it is argued that averages for physical phenomena are not homogeneous if the coefficient of variation exceeds 0.25. Because of the subjective nature of medical practice, however, a coefficient perhaps as high as 0.50 or 0.60 may be tolerated before questioning the homogeneity of a DRG. Table II shows that almost 69 percent of the DRGs in teaching hospitals have coefficients exceeding 0.60; 27 percent are greater than 0.80. The comparable figures for non-teaching hospitals are 72 percent and 25 percent, respectively. Only two percent of the coefficients are below 0.30. Hence, it would appear that the patients within most DRGs may not have consumed similar resources.[4] (For distributions of DRGs weighted by the number of patients and costs, see Grimaldi 1980a.)

As previously noted, large coefficients may partly result from DRGs consisting of patients with widely different medical conditions. An examination of a few DRGs suggests that the grouping process itself explains a portion of the coefficient of variation.[5] For example, all of the patients in DRG 9 had cancer somewhere in the gastrointestinal system plus underwent one of a list of specified procedures. These procedures include radical neck dissection and proctosigmoidoscopy. Simply stated, these procedures do not require similar hospital resources even though the length of stay might be roughly the same in certain instances. Radical neck dissection usually requires intensive pre- and post-operative nursing care, the use of an operating room and supplies, various lab tests, and pain medications. In contrast, the proctosigmoidoscopy procedure requires minimal nursing care involving only adequate bowel preparation. Also, it should be noted that patients in this DRG could have a length of stay from 1 to 42 days and the hospital would receive the same payment rate.

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[4] Questions about the homogeneity of the DRGs also are raised by a study of 79,000 discharges from Western Pennsylvania hospitals in 1975, which found that variations in the length of stay could be reduced significantly by expanding the partitioning process. Conversely, a study of 216,000 discharges from 45 Maryland hospitals suggests that fewer than 383 DRGs should be used to group patients (Swinkola, et al. 1978; Horn and Schumacker 1979).

[5] Alternatively, the resource consumption could be equivalent for a given DRG and all of the variations could be a function of differences in efficiency. The variance is most likely due to a combination of factors. To date, the influence of each factor is a matter of pure speculation.

Table II—Distribution of DRGs by Coefficient of Variation in Teaching and Non-Teaching Hospitals, 1978

Coefficient of Variation	Teaching Hospitals		Non-Teaching Hospitals	
	Number	Percent	Number	Percent
All DRGs	382[a]	100.0	381[b]	100.0
Under 0.30	8	2.1	7	1.8
0.30 - 0.39	24	6.3	20	5.2
0.40 - 0.49	36	9.4	25	6.6
0.50 - 0.59	52	13.6	55	14.4
0.60 - 0.69	86	22.5	82	21.5
0.70 - 0.79	74	19.4	96	25.2
0.80 - 0.89	47	12.3	46	12.1
0.90 - 0.99	30	7.9	27	7.1
1.00 and over	25	6.5	23	6.1

[a] One DRG had no cases in 1978.

[b] Two DRGs had no cases in 1978.

Source: Calculated from information released by the New Jersey State Department of Health.

The relatively large size of the coefficients of variation indicates a wide difference in the cost of treating patients in the same DRG and, therefore, hospitals' payment rates will differ accordingly. Table III shows the low, middle, and high 1980 payment rates for direct patient care in ten randomly selected DRGs for three non-teaching New Jersey hospitals, and the number of cases for each DRG treated by these hospitals in 1978. As expected, the differences in rates are quite large. In fact, the high payment rate is at least double the low rate for most sampled DRGs.

The variations in payment rates observed in Table III are partly attributable to small sample sizes. More than half the high and low values are associated with services rendered to no more than twelve patients. Small sample size, non-homogeneity related to methodological problems, and legitimate differences in medical practice have major implications for the fairness of the payment rates. It will be recalled that the 1980 payment rates depend upon 1978 case-mix and 1978 costs adjusted for inflation. A rate that was fair for 1978 costs may be unfair when patients are treated in 1980. To illustrate, in 1978 a hospital may have treated patients with relatively less resource

Table III—Payment Rates For Direct Patient Care, and Number of Discharged Patients, for Selected DRGs in Three New Jersey Non-Teaching Hospitals

	Coefficient of	Low Hospital		Middle Hospital		High Hospital	
DRG	Variation	Rate	Patients	Rate	Patients	Rate	Patients
A	0.58	$1,211	1	$2,307	2	$3,052	1
B	0.73	382	11	626	3	1,271	6
C	0.61	638	6	749	31	1,118	6
D	0.59	815	18	973	70	1,439	35
E	0.65	1,377	7	2,163	27	3,604	3
F	1.00	1,167	1	2,811	4	6,642	9
G	0.78	534	11	978	9	1,314	15
H	0.40	919	70	1,062	103	1,312	57
I	1.00	478	3	1,859	3	3,210	12
J	0.40	290	540	398	30	484	118

Rates rounded to the nearest dollar.

Source: New Jersey State Department of Health.

demanding conditions included in a particular DRG. In 1980, however, the hospital may treat an extremely complex case in the same DRG but receive a prospectively determined rate based on the costs of treating the low-cost patients in 1978. Therefore, the hospital's reimbursement would not cover costs. Conversely, a hospital would be overpaid in the reverse situation. Whether underpayments and overpayments cancel for a particular hospital is unknown; in any event, no formal procedure currently exists to remedy this potential inequity.

For the first year of the new program, potential inequities stemming from the general absence of homogeneity have been reduced by the 1980 weighting scheme (WO and WS) used to calculate payment rates. This scheme places comparatively heavy reliance on a hospital's own cost in treating patients. In fact, the cost-weighted average for WO implied from the values shown in Table II is approximately 0.80 for both teaching and non-teaching hospitals. Hence, a hospital's actual allowable costs for 1978, adjusted for inflation, will heavily influence the reimursement in 1980. But what about the future?

WO and WS are arbitrarily computed figures and there is little scientific justification for using these over some other set of weights. Indeed, in the aborted 1979 New Jersey experiment, WO and WS were computed differently.[6] Similarly, the use of mean values for the standard ($\overline{PS}$) in the rate calculation could be replaced by median values, which implies a cutback in hospital reimbursement. In any event, since regulatory agencies are committed to cost containment and since the federal government has agreed to pay case-mix rates for Medicare and Medicaid patients subject to a cap on its aggregate financial liability, in the near future the rate-setting authority may seek to tighten the new reimbursement method. Additional reliance on standard costs ($\overline{PS}$), however, is likely to lead to inequities insofar as the DRGs are not homogeneous and administrators are not given sufficient lead time to improve their cost performance.

Finally, there is one major potential inequity that must be addressed. Namely, patients within a DRG are charged essentially the same rate although their resource consumption may differ significantly. For example, a patient in a DRG may be hospitalized for 5 days and generate charges of $2,500 while another patient stays 40 days and has charges of $10,000. If the payment rate is $6,250, the patient with the shorter stay would subsidize much of the care received by the other patient. This might especially disturb the patient with the shorter stay if he had no hospital insurance.[7]

MANAGERIAL CONCERNS

Case-mix reimbursement will probably change many aspects of a hospital's daily activities. Noticeable effects are expected in the medical records, billing, and finance departments. The DRG method also requires additional physician concern with administrative matters and cost-effectiveness in the delivery of care. This section briefly highlights three areas of managerial concern: efficiency, physician cooperation, and budget preparation.

Efficiency

The statistical output of the DRG model provides hospitals with previously unavailable information about the costs of treating patients with different medical problems. Hospital administrators now can compare their own departmental costs per patient with those of other hospitals by DRG and eventually may be able to make similar comparisons among physicians. Unfortunately, however, the data are currently almost two years old when received by the hospital and their usefulness is limited by the general absence of homogeneity noted above.

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[6] In 1979, twenty-three hospitals agreed to have their rates set for Blue Cross patients only. Payment rates were calculated and issued, but no hospital was paid a case-mix rate. WO was set at the coefficient of variation; WS, at the difference between one and the coefficient. NJDOH terminated the experiment when it could not resolve certain issues with Blue Cross.

[7] It must be considered that this hypothetical example may be structured such that the uninsured patient receives the subsidy. Furthermore, one should note that per diem reimbursement involves a degree of cross subsidization as well.

Another problem is that most DRGs contain a comparatively small number of patients. An examination of the patient population in six hospitals revealed that most patients fell within a fairly small number of DRGs, suggesting that many DRGs are superfluous. As shown elsewhere (Grimaldi 1980a), one-fifth of the DRGs accounted for about 63 percent of the patients in teaching hospitals and 66 percent in non-teaching hospitals. The twenty highest volume DRGs contained approximately 40 percent of the patients in non-teaching hosptials; the 5 largest DRGs accounted for 19 percent of total patients.

The distribution of direct patient costs among the 383 DRGs was found to be even more unequal than the distribution of patients. Therefore, it becomes essential for administrators to focus primarily on the DRGs with numerous patients. These distributions also suggest that for many DRGs, administrators will be unable to draw reliable conclusions about the cost performance of different departments because DRG sample sizes are too small. Furthermore, case-mix may change substantially between the base and rate years, thereby complicating planning activities.

Physician Cooperation

The DRG approach to case-mix reimbursement assumes that hospitals function under the authority of one decision-maker who specifies goals and objectives adhered to by all employees. In point of fact, a hospital operates under the authorities of a Board of Trustees, hospital administrators, medical staff, and department heads. Each authority has goals and objectives different from the others, and disagreements are not uncommon. Hence, if a rate-setting model is to be equitable and encourage efficiency, it must relate to a hospital's internal organization and the way hospital resources are allocated.

The DRG model may adversely affect working relationships between hospital administrators and the medical staff (Grimaldi 1980b). First, conflicts may result over the paperwork. The model requires doctors to complete their charts in a timely and accurate manner since reimbursement depends upon patients' diagnoses rather than the traditional length of stay. Late and erroneous charts may seriously affect cash flow and may lead to improper reimbursement. To expedite matters, some administrators might suspend a doctor's privileges until completed charts are submitted, or levy fines scaled according to the time period during which the charts are outstanding.

Second, administrators are confronted with the problem of getting "inefficient doctors," i.e., those whose treatment plans cost more than the average, to provide care at lower cost. Undoubtedly, in many instances, physicians will repudiate norms in favor of individualized patient needs. But how long can administrators permit physicians to render unreimbursed services? To encourage doctors to improve their cost effectiveness, some administrators might link approval of requests for new equipment to a doctor's "performance rating." Furthermore, rate setters might play an implicit role in resolving this problem if they implement regulations that place doctors at risk for a portion of a hospital's unreimbursed cost. Indeed, cogent arguments have been made suggesting that any reimbursement scheme that is oblivious to the doctor's role in generating hospital costs will have limited success in minimizing costs (Harris 1977; Detsky 1979).

Budget Preparation

Case-mix reimbursement adds to the complexity of preparing hospital budgets because of the uncertainty surrounding the types of cases a hospital will treat during the year. At the present time, NJDOH does not furnish the hospitals with case-mix forecasts, but instead bases estimates of 1980 revenue on 1978 case-mix. However, a hospital can obtain additional revenue if the Rate Setting Commission accepts an explanation of the hospital's expected increase in the number of cases or a shift to more expensive DRGs. NJDOH encourages hospitals to base such predictions on current usage of patient days and units of ancillary services. Unfortunately, it is extremely difficult to translate these measures into DRGs.

Another problem is that monthly income is apt to exhibit greater variability under the DRG approach because income is affected by both the number and types of patients treated. In contrast, under a per diem method, a significant proportion of income can be calculated simply by multiplying days of care by the established daily rate regardless of the type of patient treated. Also, unlike the per diem method, a relatively long time may elapse before the revenue earned from treating particular patients can be determined.

CONCLUSION

Case-mix reimbursement is conceptually superior to per diem reimbursement, but its practical applicability remains to be determined. Moreover, until the methodological problems are corrected, the DRG method is of limited use in addressing efficiency, and additional reliance on standard costs will heighten equity problems. Furthermore, even though less precise from a theoretical perspective, the New Jersey approach to case-mix reimbursement would be more predictable and manageable if the number of DRGs were reduced considerably. Perhaps case-mix information should be used to modify existing per diem rates for interhospital differences in patient needs rather than replace per diem reimbursement entirely.

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The Impact of Technology on Health Care Costs

*by Philip G. Cotterill**

INTRODUCTION

The contribution of new medical technologies to rising health care costs has attracted increased attention in recent years, as general concern over the cost problem has grown.[1] The belief that new technologies are driving up the cost of health care has become fairly widespread. One result of the increased concern with medical technologies is the Health Services Research, Health Statistics, and Health Care Technology Act of 1978 (P.L. 95-623), which specifies that cost-effectiveness and economic impacts of technology are to be taken into account in the research and assessment activities mandated by the Act. Traditionally, both private and governmental assessment efforts have emphasized medical effectiveness and patient benefits without much regard for cost.

This paper evaluates the evidence for the belief that new medical technologies tend to raise health care costs. No attempt is made to make benefit-cost assessments about either specific technologies or medical technology in general despite the fact that much of the recent discussion has questioned whether the benefits of recent medical technologies are worth the cost. The complexity of the technology issue warrants limiting this paper to the cost aspect of the question. Of course, it must be recognized that consideration of the cost impact alone is insufficient for making policy decisions about either spending for medical research and development or programs which affect the diffusion and utilization of new medical technologies such as Certificate of Need. This paper examines various studies which attempt to assess the quantitative impact of technology on health care costs. These studies illustrate the problems encountered in making generalizations about the cost impact of technology.

The problems result from the diversity of medical technologies and the complexity of their impacts, as well as from limitations of the research. For example, medical technology is frequently defined very broadly as "the set of techniques, drugs, equipment, and procedures used by health care professionals in delivering medical care to individuals, and the system within which such care is delivered" (Office of Technology Assessment 1976). In addition, the economist's distinction between product and process innovation is not very useful in the case of medical technology. If health care "products" are defined as the outcomes of curing or treating specific illnesses or conditions, then most medical innovations would be process innovations. Alternately, if treatments are considered to be the products, then most medical innovations involve both product and process innovation because they typically change the resources required to produce new treatments. In neither case does the product-process distinction contribute very much to our understanding of the important issues.

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[1] Attention is restricted here to direct health care costs. For the purposes of this paper, direct health care costs are defined as total expenditures for health care services. Indirect costs, such as national output losses due to illness, are not considered in this paper.

Despite these caveats, some conclusions can be drawn from the studies reviewed in this paper. There are some technologies which, if widely utilized, will certainly drive up costs because on a unit basis they require large quantities of health care resources: expensive capital equipment, skilled technicians, etc. Open-heart surgery and radiotherapy fall into this category. On the other hand, some new technologies have been inexpensive compared to earlier methods of treatment. Immunization and drug therapies for the control of infectious diseases offer many such examples.

During this century, medical technologies have had an important impact on both the quantity and quality of care provided. On the one hand, technological change has greatly expanded the range of care available, making possible the treatment of many conditions for which little could be done previously. Some of these changes have tended to increase the total amount of care provided and have contributed to the greater resource intensity of hospital care. However, other changes have tended to reduce the amount of care required, especially by reducing the extent of hospitalization. Immunization and drugs which have inhibited the onset and contained the spread of infectious diseases have exerted a cost-saving influence on total costs by reducing the number of cases of illness requiring treatment.[2]

New technologies which avert costs by reducing the incidence and lessening the severity of disease may not lower actual health care expenditures. Rather, expenditures may only be lower than they would have been in the absence of the advance. In this sense, averted costs have a less visible impact than changes in actual treatment costs. The resource-intensive technologies which tend to raise actual treatment costs attract more attention than the technologies which avert costs.

The relationship between technological change, actual treatment costs, and averted costs is a complicated one, however. In an indirect way, the total averted treatment costs due to technological advances against the infectious diseases may overestimate the cost-saving impact of technology. This is because the extension of life span accomplished by reductions in infectious diseases has been accompanied by an increased incidence of degenerative diseases, some of which require costly chronic care. In other words, technological advances against infectious diseases both averted future treatment costs for infectious diseases and gave rise to increased treatment costs for various degenerative diseases, such as heart disease and arthritis. Interrelationships of this type are very difficult to assess quantitatively, and existing research contributes little to our understanding of this issue.

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[2] In many cases these advances lowered average treatment costs dramatically. For example, the treatment of tuberculosis with drugs replaced higher cost treatment involving long periods of institutionalization. These technologies have also tended to lower average costs by lessening the severity of individual cases.

Existing research provides some answers to questions about the ways in which technological change has affected average treatment costs. As we shall see when specific studies are discussed, there is evidence that technology has been in some instances cost-increasing and in others cost-saving. The difficulty arises when broad generalizations about the net cost impact of all medical technology are attempted.

OVERVIEW OF EXISTING STUDIES

Hospital cost studies occupy a central position among empirical studies of the impact of technology on health care costs. Hospital costs have received special attention because they are both the largest and the fastest rising component of health care expenditures. Most of the research focuses on the causes of increases in measures such as average cost per patient day or average cost per admission (Baron 1974; Davis 1974; Feldstein 1971; Feldstein and Taylor 1977; Redisch 1974; Waldman 1972). Many of the hospital cost studies assume that the role of technology can be measured by changes in the quantities of real inputs used per unit of hospital output (for example, Feldstein 1971). Increases in real nonlabor inputs are often assumed to reflect the increased use of equipment. Other hospital cost studies have used a time trend variable within the framework of multiple regression analysis to measure the impact of technology (Baron 1974; Davis 1974). A few studies provide more specific information linking hospital unit costs to the availability and utilization of specific facilities and technologies (Redisch 1974; Berry 1974).

Another source of relevant information are studies of the costs of specific hospital-based technologies. (For example see Russell 1975, 1976, 1978.) Only a few of these studies have been selected for review because they are numerous and vary greatly in quality. The technologies studied include intensive care units, radiotherapy units, inhalation therapy units, and computed tomography. To a limited degree, these studies permit comparisons of the relative magnitudes of the capital and operating costs (both labor and nonlabor) of these technologies.

A third source of useful information about the ways in which technological change has affected costs has been obtained by tracking changes over time in average treatment costs and their components for various conditions (Scitovsky and McCall 1975; Sheeley and Sherman 1976). These studies permit us to separately evaluate the impact of changes in the intensity of care and in the length of treatment. Because of the amount of detailed information required for research of this type, existing studies cover only a limited number of conditions and a small number of cases. However, these studies do not focus as narrowly on the hospital as the other types of studies mentioned above. In particular, drugs, and physician services are included, whether or not they are provided in the hospital. (These studies are among the few sources of information about the impact of technology on nonhospital costs.)

Finally, two studies have attempted to measure the overall impact of technology on total health care expenditures (Mushkin, et al. 1976; Fuchs 1972). Both studies adopt the "residual" approach in which the effect of technology is measured as a catchall for all factors not otherwise accounted for. While the residual approach circumvents much of the need for detailed, and often unavailable data, it raises its own set of problems.

HOSPITAL COSTS

Between 1950 and 1975, average cost per patient day rose at an annual rate of 9.5 percent as hospitals provided a more and more sophisticated and expensive type of care (Feldstein and Taylor 1977). Approximately 50 percent of this increase can be attributed to the use of increased quantities of labor and nonlabor inputs. The other 50 percent is due to increases in hospital input prices. The rate of increase in the use of nonlabor inputs per patient day accelerated during the period from an annual rate of 4.8 percent (1951-1955) to 6.0 percent (1960-1966) to 11.0 percent (1966-1970) (Waldman 1972). Looking more specifically at increases in hospital costs relative to other prices in the economy, Feldstein estimates that about 75 percent of the relative increases in average costs per day between 1955 and 1975 can be attributed to increases in the use of real inputs, and only 25 percent to the fact that hospitals' input prices have risen faster than consumer prices in general (Feldstein and Taylor 1977). These results were all derived using the same statistical decomposition technique.

Other studies have made use of different techniques. Davis (1974) used a multivariate analysis which enabled her simultaneously to take into account changes in demand, case mix, wage rates and technology. She found that technology possibly was responsible for as much as 38 percent of the predicted increase in total hospital expenses per admission for the 200 hospitals in her sample covering the years 1962-1968. Demand variables such as the prices of hospital care, hospital insurance coverage, income, physician and hospital availability, and population characteristics accounted for 45 percent of the increase, case-mix variables another seven percent, and increases in average earnings of hospital employees the remaining 10 percent.

However, her chief measure of technology is similar in many respects to the measure used by the residual method discussed earlier. Technology is primarily measured as a time trend and captures any influences which tended to systematically increase cost between 1962 and 1968 and which were not picked up by other variables included in the analysis. As a result, the difficulty of separating the effects of technological change from those of increased demand lends uncertainty to Davis' quantitative results.

In addition, the Davis paper raises the question of the relationship between technological change and changes in hospitals' case mix. The diffusion of new hospital technologies would be expected to affect a hospital's case mix since this diffusion alters the types of patients a hospital is capable of treating. As complex new technologies have spread from major medical centers to smaller hospitals throughout the country, the proportion of complex cases in the smaller hospitals has increased. Davis probably captures at least part of the effect of new technologies by controlling for differences in the value of plant assets per bed among hospitals. This effect is not included in the 38 percent figure.

Baron (1974) obtains an estimate of similar magnitude to that of Davis. Baron estimated average cost functions using a pooled time series cross-section for a sample of hospitals during the period 1968-1971. The cost function employed is derived from a Cobb-Douglas production function under the assumption that hospitals minimize costs. Average cost is a function of average factor prices, output, and a variable used to measure technological change.[3] Unfortunately the technological change variable also captures changes in the quality of care and changes in case mix. Hence, it reflects the net effect of all three of these factors. Baron's estimates imply that 30-35 percent of the increases in average costs between 1968 and 1971 can be attributed to technology, quality and case-mix changes.

One study attempts to link hospital unit cost measures to the intensity with which certain medical services are utilized by the hospital (Redisch 1974). A major quantitative result of this study is that more than one-third of the increase in operating costs per adjusted patient day can be attributed to increases in the availability and utilization of the set of medical services investigated. Especially important are the intensity of use of operating room visits, nuclear medicine procedures, and, for large hospitals, therapeutic radiological procedures. Other services with important cost impact are diagnostic radiological procedures and lab tests.

Redisch's data cover the period, 1968-1971, and include 285 short-term hospitals. Semi-logarithmic cost functions are estimated for the pooled cross-section time series and the intercepts are allowed to vary for each year. Two measures of unit operating costs are employed as dependent variables, and the independent variables refer to utilization of each medical service per adjusted patient day or per adjusted admission.[4]

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[3] Strictly, this variable measures only "disembodied" technological change.

Unlike other studies which make use of dummy variables for time, Redisch does not interpret his time coefficients as reflecting the effect of technological change. He tends to regard them as measuring the effect of inflation, though he does recognize that they also may capture changes in the composition of the services used as independent variables, and in this sense may embody technological change. No attempt is made to separate these two effects.

While the Redisch study focuses on the relationship between average costs and the intensity of utilization of certain medical services, some generally corroborative evidence linking average costs to the availability of certain facilities is presented by Berry (1974). Using data on approximately 6000 hospitals for the period 1965-67, Berry estimates average cost functions containing dummy variables which indicate whether the particular hospital has a specific facility or not. Of particular interest is the positive, statistically significant effect on average cost of the following services: post-operative recovery room, pathology laboratory, blood bank, electroencephalography, radioisotope therapy, and cobalt therapy.

Existing research implies that the increasing resource-intensity of a day of hospital care, which is associated with changes in capital-embodied, hospital-based technologies, has made a significant contribution to higher hospital costs per day of care (or admission). However, the studies reviewed here have serious limitations. The statistical decompositon analyses (Feldstein 1971; Feldstein and Taylor 1977; Waldman 1972) break down increases in average costs into parts attributable to changes in prices and changes in quantities of inputs. Technological change is only one of many factors which influences the amounts of inputs used in producing hospital care, and these studies do not enable us to identify the role of technological change directly. The regression studies (Baron 1974; Davis 1974; Redisch 1974) have some real analytical advantages but focus on very limited time periods—1962-1968 (Davis), and 1968-1971 (Baron and Redisch). Redisch (1974), in conjunction with Berry (1974), provides the most direct evidence that expensive capital-intensive technologies are an important source of higher average costs of hospital care.

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[4] Operating costs are defined as total salary (except for medical staff) and other direct expenses. Due to a lack of uniformity in accounting practices, Redisch omitted stated depreciation from his cost variables. However, he reports that preliminary tests using total costs yielded results consistent with those for operating costs alone.

Nine services are included in constructing the independent variables: operating room visits, pathology tests, nuclear medicine procedures, anesthesiology charge slips, pharmacy line items sold, inpatient plus outpatient lab tests, inpatient plus outpatient diagnostic radiology procedures, therapeutic radiology procedures, and blood bank units drawn.

COSTS OF SPECIFIC HOSPITAL-BASED TECHNOLOGIES

Detailed evidence about the availability of specific facilities in hospitals has been compiled by Russell (1975, 1976, 1978) utilizing the survey data collected by the American Hospital Association. Russell summarizes diffusion trends for selected facilities during the period 1949-1974, and examines the information on the costs and benefits of these technologies which exists in the medical and hospital management literature.

The survey of diffusion trends reveals that the largest hospitals are the first to adopt new technology, and they remain in the lead as diffusion proceeds. Contrary to popular belief, it is not clear that voluntary hospitals are more likely to adopt new technology than are for-profit hospitals, once size differences are taken into account.

The survey also suggests that the spread of intensive care units—recovery rooms, mixed ICUs, coronary care units—and inhalation therapy departments contributed significantly to increases in hospital costs during the 1960s. Diffusion of these facilities among the smallest hospitals may have continued through the 1970s. Russell reports that cost increases among medium and large sized hospitals may have resulted from the diffusion of diagnostic and therapeutic radioisotopes, and perhaps the electroencephalograph. Among the largest hospitals, several expensive types of facilities such as burn units, renal dialysis, and open heart surgery facilities, while not yet standard equipment, have been adopted in sufficient numbers to produce noticeable cost increases.

The evidence presented by Russell suggests that technologies such as intensive care units and inhalation therapy departments have been a major source of past increases in hospital costs. She estimates that average cost per day would have been 9 percent lower in 1974 had there been no intensive care beds. Russell suggests that the widespread diffusion of intensive care units may in part result from the fact that no extremely complex technologies are involved, and they can be applied to a wide range of disease conditions. In many ways these units represent more of an organizational innovation than a technological one. Other expensive new technologies, such as open-heart surgery and radiotherapy units, which are more complex technologically, have experienced less widespread diffusion.

Among the previously discussed studies of hospital costs, it is not possible to distinguish clearly between the effect of technologies on capital acquisition costs and operating costs. While the initial capital costs attract the most attention, in the long run it is probably the operating costs which are most important. For example, Redisch demonstrates that the intensity with which expensive services such as nuclear medicine and radiotherapy are used has a significant impact on overall unit operating costs. CT scanners, whose purchase prices range from $300,000–$700,000, have annual operating costs (exclusive of initial capital costs, deprecation, etc.) of approximately $186,000 (American Hospital Association 1977).[5]

Even information regarding initial capital costs is not readily available in the published literature. Russell presents some cost data for radiotherapy units and open-heart surgery units. She reports that cobalt therapy units sell for $100,000–$125,000, and are the least expensive of the supervoltage sources. Linear accelerators and betatrons are more expensive. A few linear accelerators as large as 35 MV are in use in radiotherapy centers and cost about $1 million. Construction costs for radiotherapy units are high due to the shielding necessary to prevent accidental radiation. Russell reports construction costs in mid-1975 of $120-$200 per square foot. She reports the cost of constructing and equipping an average sized operating room for open-heart surgery at $78,000–$106,000. The average cost of constructing and equipping a cardiac catheterization lab, excluding the ancillary areas, is between $500,000–$600,000. Thus, an open-heart surgery unit, excluding ancillary areas, costs $600,000–$700,000, which is approximately the same as an expensive CT scanner.

Although these figures are impressive, the overall impact of direct expenditures for capital equipment on total cost increases is relatively modest. Cromwell, et al., (1975) estimate that direct expenditures on capital equipment (based on sample data) explained only about 9 percent of the per diem hospital cost inflation during 1964–1973.

AVERAGE TREATMENT COSTS OF SELECTED ILLNESS CONDITIONS

Studies of changes in the costs of treating specific conditions over the period 1951–1971 have found that the cost-raising aspects of new technology have tended to more than outweigh the cost-saving aspects, but this result is by no means uniform for all conditions investigated (Scitovsky and McCall 1975).[6] Changes in treatment are "cost-raising" if actual costs per case increased more during the period than they would have due to price increases alone. Similarly, "cost-saving" changes occur if the actual costs per case at the end of the period, while greater than at the beginning, are less than if no change had taken place in the methods of treatment.

Most important in contributing to the cost-raising impact of technology have been increases in the number of diagnostic tests and therapeutic procedures. For example, the average number of lab tests for perforated appendicitis rose from 5.3 per case in 1951 to 14.5 in 1964 to 31.0 in 1971. The average number of electrocardiograms for myocardial infarction rose from 5.4 in 1964 to 9.0 in 1971.

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[5] There is also some recent evidence that increased competition among manufacturers and creation of a market for used scanners is significantly lowering purchase prices (Blue Shield, 1978).

[6] The conditions studied were otitis media in children, appendicitis (subdivided into simple and perforated cases), maternity care, cancer of the breast, forearm fractures in children (subdivided into cases requiring a cast only, cases requiring a closed reduction without a general anesthetic, and cases requiring a closed reduction with a general or regional anesthetic), myocardial infarction, pneumonia, and duodenal ulcer.

The major cost-saving factor during the period was a decline in the average length of hospital stay. In the case of maternity care, the average length of hospital care declined from 4.6 days in 1951 to 2.8 days in 1971. For cancer of the breast, the decline was from 12.7 days in 1951 to 8.9 days in 1971.

While these trends are descriptive of the general changes which have occurred, there are some exceptions worth noting. For example, in the case of otitis media in children, changes in treatment were cost-saving on balance between 1951 and 1964. This result was primarily due to a shift in treatment from home visits to physician's office visits. Less important, but also cost-saving was the change from parenterally administered drugs (penicillin injections) to orally administered antibiotics.

Between 1964 and 1971, changes in treatment were cost-saving on balance for several conditions. For maternity care, reductions in the average hospital stay and an increase in the percentage of women delivered without a general anesthetic more than offset the increase in the number of lab tests and the increased use of in-hospital drugs and miscellaneous hospital supplies. For cancer of the breast, a reduction in the average hospital stay and the partial substitution of modified radical mastectomies for radical mastectomies more than offset the cost-raising factors. For both pneumonia and duodenal ulcer, changes were on balance cost-saving. The data for forearm fractures present a mixed picture, but an important cost-saving factor was the shift of treatment to the orthopedist's office and away from the hospital.

Between 1964 and 1971, the most dramatic cost-raising effects occurred in the treatment of myocardial infarction. Increased use of intensive care units was chiefly responsible. Although the average hospital stay fell by about one day (from 19.7 days in 1964 to 18.8 days in 1971), the net additional cost of the substitution of care in the CCU and intermediate CCU for the 1964 type of care in regular hospital beds (and minimal use of the ICU) amounted to about $385 per case in 1971 dollars. This figure does not include the additional cost due to increases per case in the number of lab tests (from 37.9 to 48.5), EKGs (from 5.4 to 9.0), intravenous solutions (from 1.6 to 10.6), X-rays (from 1.3 to 6.3), and inhalation therapy treatments (from 12.8 to 37.5).

While the results of the Scitovsky study seem quite reasonable, their limitations should be noted. A small number of conditions or illnesses was examined, and the cost data are based on a single group of physicians (The Palo Alto Medical Clinic) and a single hospital (the Stanford University Hospital). The Palo Alto Medical Clinic is a multi-specialty, largely fee-for-service group practice, which has its own laboratory, radiology, physiotherapy, and EKG departments. In the absence of similar studies for other different medical care settings, it is impossible to determine how representative the

Scitovsky results are of the nation as a whole.

A similar study of changes, between 1964 and 1974, in the cost of treating pneumonia at four Boston area hospitals found an overall reduction in hospital resource charges when the 1974 charges were used for both years (Sheeley and Sherman 1976). Reductions in length of stay more than offset increases in the cost of diagnostic and therapeutic resources.

These studies of changes in treatment costs find that increased utilization of diagnostic tests and therapeutic procedures have exerted significant upward pressure on average treatment costs. As noted earlier, Redisch (1974) linked the utilization of expensive tests and procedures to higher average hospital costs. Yet for some illness conditions, such as pneumonia, the upward pressure was more than offset by reductions in length of hospital stay. The most striking case of increased costs was that of myocardial infarction, where the results of both Scitovsky and McCall (1975) and Russell (1978) point to the cost-increasing impact of intensive care and coronary care units.

TOTAL HEALTH CARE EXPENDITURES

There are only two studies which have attempted to assess the impact of technological change on total health care expenditures (Fuchs 1972; Mushkin et al., 1976), and both of them utilize the residual approach. These studies can be interpreted as indicating that the net impact of technology has been small for the periods of time investigated. Mushkin attributes to technology -0.4 percentage points of the 7.8 percent annual rate of increase in health care expenditures between 1930 and 1975. Fuchs' results imply that technological change accounted for a maximum of 0.6 percentage points of the 8.0 percent annual rate of increase in health care expenditures between 1947 and 1967. According to Mushkin, technological change was slightly cost-saving on balance, while according to Fuchs it was slightly cost-increasing. However, in both cases the contribution of technological change was small.

The result could be interpreted as providing support for the view that cost-saving advances, such as those against infectious diseases, were pretty much offset by more recent cost-increasing advances. In addition, Fuchs obtains a larger residual for the period of 1957-67 (1.0 percent) than for the period 1947–57 (0.2 percent), which is also consistent with this view.

A related study by Fuchs and Kramer (1972) applied a similar type of statistical decomposition analysis to differences, between 1956–66 and 1948–56, in the rate of increase of per capita expenditures for physicians' services. Most striking is the fact that the quantity of physician services consumed in the earlier period changed at an annual rate of –0.4 percent, and in the latter period, 3.0 percent. Differences between periods in real per capita income, the distribution of income, and the age-sex structure of the population account for only about 0.3 of the 3.4 percentage point difference. That leaves an unexplained residual of 3.1 percentage points which Fuchs and Kramer largely attribute to differences in the impact of technology between the two periods of times. Advances in drug therapy during the earlier period, especially the use of antibiotics, had a major impact on health and were "physician-saving." Since 1956, "physician-using" advances have been more common.

Although these results seem intuitively plausible, problems with the residual method are serious enough to cast real doubt on the meaningfulness of these studies. The most serious problem results from the fact that the method provides no information about the relevant causal relationships, because it is derived from an identity. A related problem results from the fact that technological change is highly correlated with the other variables used to account for changes in health care expenditures. New technologies have become widespread as a result of increased demand for health care. The variables which capture the effects of increased demand—rising population, income, third-party payment—probably also capture the effects of technological change, especially in those cases where technological change has tended to increase costs. The reason is that cost-increasing advances can only spread if somewhere in the system the demand exists to finance them. Thus those increased expenditures attributed to increased demand have been made for types of health care which have changed over time as technology changed. It is not altogether clear—conceptually or empirically—what change in expenditures is "due to" changes in technology.

LIMITATIONS OF EXISTING STUDIES

Whatever measure of technology the researcher adopts, he faces a tradeoff. On the one hand, since technological change may affect costs in many ways, both directly and indirectly, an inclusive indirect measure of technological change is more likely to capture the full range of effects. On the other hand, since technological change is typically defined to include so many different kinds of effects, it is really necessary to be able to sort out the impact of specific aspects of technological change. In order to do this, it is necessary to measure technological change in ways which do not capture all of its effects.

For example, the studies referred to above utilize measures of technological change which range from very general to rather specific. The residual and time trend measures are the most general. If the residual accurately reflected all the effects of technological change, it would capture the effects of all changes in drugs, procedures, equipment, etc., induced by changes in technology. The amounts of both labor and nonlabor inputs might well be affected, as well as the ways in which these inputs are organized in the delivery of health care. The advantage of the residual approach under these circumstances is that it would measure the net impact of all these influences. The disadvantage of the approach is that it cannot tell us anything about the impact of any specific aspect of technological change.

Changes in the intensity of input use constitute a more specific measure of technological change than does the residual. However, the input intensity measures have two drawbacks: They may change for reasons other than changes in technology,[7] and with a few exceptions (Redisch 1974), they are typically measured in too gross a manner to provide any insight into the important components responsible for their change. For example, standard measures of nonlabor inputs do not indicate the extent to which the large expenditure items, such as CT scanners and heart lung machines, are responsible for their increase. To a limited extent, the studies of the costs of specific illness conditions and technologies fill this gap by providing some information about specific cost components. All these limitations severely restrict our ability to make simple statements about the impact of technological change on health care costs.

SUMMARY

This paper has attempted to summarize existing research on the impact of technology on health care costs, and to identify the questions which need to be answered in order to give us a clearer understanding of the ways in which technology affects health care costs.

The most clearcut result to emerge from the existing research is that a day of hospital care has become more resource intensive and hence more expensive during the past twenty-five years. Both the hospital cost studies and studies of changes in average treatment costs for specific illnesses support the view that technological change has contributed to the increased resource intensity of hospital care.

However, the impact of technological change on total hospital costs must also take into account the impact of technological change on the extent of hospitalization. Studies show that average lengths of hospital stay have declined for many conditions. While one could debate the issue of whether or not some of the changes in medical practice responsible for these declines should be classified as "technological change," it seems clear that technological change has affected the extent of hospitalization. The impact of new technologies on the treatment of tuberculosis and pneumonia provide two obvious examples.

Existing research does not enable us to assess with any confidence the net effects on costs of all technological innovations. Only a very limited number of diseases have been studied and only for selected periods of time. There are reasons for believing that the cost impact of technology has varied through time, depending on the resource intensities of the dominant technologies of the period.

The very few investigations of the impact of technology on total health care expenditures conclude that, on balance, the net effect of technology on cost has been small over the past 30–45 years. This result can easily be reconciled with the facts that the major cost-saving advances in the control of communicable diseases occurred during the 1940's and 1950's, whereas more recent advances of the past 20 years, such as dialysis, cancer chemotherapy, and open heart surgery, have typically involved resource intensive therapies with large numbers of persons potentially requiring treatment. The implication is that costs averted as a result of the former advances have been offset by the effects of later advances. However, in consideration of these studies, one should be very hesitant about accepting this conclusion.

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[7] Given high fixed costs in hospitals, an excess capacity due to decreased occupancy rates would result in an increase in the amount of real inputs used per patient day.

In order to improve our understanding of the technology–cost issue, more attention needs to be paid to the interactions between technology and other important factors in the health care system. For example, since costly new technologies can only be widely adopted if patients and/or third-party payors are willing to finance the required expenditures, the interaction between technology and demand is especially critical. Under what circumstances is it appropriate to say that technological change, as opposed to increased demand, is responsible for the increased costs? If cost-saving technological advances occurred which result in averted treatment costs for some illnesses, would total health care costs be reduced or would these expenditures rapidly be channeled to the diagnosis and treatment of other diseases? Unfortunately, existing research does not enable us to answer these questions. Both improved conceptual and empirical understanding of the relationship between technological change, averted costs, and the demand for health care are necessary before these answers can be obtained.

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Income Differences Between Male and Female Physicians *by Joel D. Bobula**

INTRODUCTION

A common finding in studies of occupational earnings is that females are often paid less than males. Explanations of this finding run from those of discrimination by employers against females to differences in male-female endowments of personal characteristics related to productivity. Although physicians enjoy a high measure of professional stature and are among the highest paid professional occupational groups in the United States, past studies have found that women physicians earn less than men (Kehrer 1976).

This paper examines data from a recent survey of a sample of non-federal, office-based physicians to determine whether any systematic differences continue to exist between the sexes in average income for designated specialty categories. Possible explanations for such a differential are explored as well. These survey findings are then compared with previously published research findings to determine whether changes have occurred over time.

THE DATA

Data for this analysis are from the American Medical Association's Twelfth Periodic Survey of Physicians conducted in 1978. (For a description of the survey methodology, see Bobula 1979.) Two samples were drawn from the AMA Physician Masterfile which contains current and historical information on every known physician in the United States. The first was a random sample of approximately five percent of all non-federal, office-based physicians in practice in the United States. The second sample consisted of 2,099 female physicians. This "oversample" of female physicians was designed to provide sufficient numbers of women physicians in selected demographic and specialty categories; therefore, allowing statistically reliable estimation of population parameters for women physicians.

Self-administered questionnaires concerning organizational and economic characteristics of the physicians' practice patterns were mailed to physicians in each of the samples in the Spring of 1978. The survey was closed in September 1978 with 4,465 (49 percent) usable questionnaires returned from the main sample, and 972 (47 percent) usable questionnaires returned from the female oversample.

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Table I—Distribution of Male Respondents from Main Sample and Female Respondents from Oversample by Specialty, 1978

Specialty	Distribution of Physicians Male Physicians (Main Sample)	 Female Physicians (Oversample)
General/Family Practice	21.1%	15.3%
Internal Medicine	16.7	10.1
Surgery	24.2	4.0
Pediatrics	5.2	19.8
Obstetrics-Gynecology	7.3	9.3
Radiology	4.9	3.6
Psychiatry	7.1	16.9
Anesthesiology	3.7	7.1
Other	9.7	13.8
Total	100.0	100.0

Source: Twelfth Periodic Survey of Physicians. March 1978. Center for Health Services Research and Development, American Medical Association.

Table II—Distribution of Male Respondents from Main Sample and Female Respondents from Oversample by Age, 1978

Age	Distribution of Physicians Male Physicians (Main Sample)	 Female Physicians (Oversample)
Under 35	11.0%	20.5%
35-49	42.3	40.8
50-64	35.1	30.6
65 and over	11.5	8.1

Source: Twelfth Periodic Survey of Physicians. March 1978. Center for Health Services Research and Development, American Medical Association.

THE RESULTS

Table I displays the distribution of survey respondents by specialty for males in the main sample and for the female oversample. Female physicians in the sample (as in the population of office-based physicians) are proportionately underrepresented in the surgical specialties and overrepresented in the specialties of pediatrics and psychiatry, relative to their male counterparts. Female respondents also tended to be younger and tended to locate in large metropolitan areas of the United States. (See Tables II and III. Also, for a more detailed description of the characteristics of female physicians see Wunderman, Part II of this volume.)

The differences in the distribution of male and female physicians by specialty crucially impacts on the differences in hours of work, weeks of work, and income that are discussed below. Because the specialty mix of the male and female populations differs, the "typical" male and the "typical" female physician will have different net incomes and work patterns even if no specialty-specific differences exist in these characteristics. To control for differences in the specialty mix of male and female physicians, weighted total hours, weeks, and net incomes are computed. The specialty distribution of the total office-based physician population determines these weights.

WORK PATTERNS AND PRACTICE CHARACTERISTICS

Male physicians were more likely than female physicians to work in the traditional solo or group practice setting (Table IV). Women more often worked in some other setting, such as a clinic, student health center, local government agency, or corporate setting. Similarly, men more often received a fee-for-service reimbursement or

Table III—Distribution of Male Respondents from Main Sample and Female Respondents from Oversample by Location of Practice, 1978

	Distribution of Physicians	
Location	Male Physicians (Main Sample)	Female Physicians (Oversample)
Nonmetropolitan	16.7%	10.0%
Metropolitan less than 1,000,000	35.0	25.8
Metropolitan 1,000,000 and over	48.3	64.2

Source: Twelfth Periodic Survey of Physicians. March 1978. Center for Health Services Research and Development, American Medical Association.

Table IV—Distribution of Male Respondents from Main Sample and Female Respondents from Oversample by Type of Practice, 1978

Type of Practice	Distribution of Physicians			
	Male Physicians (Main Sample)		Female Physicians (Oversample)	
	Number	Percent	Number	Percent
Solo	2,043	49.5%	413	43.3%
Partnership or Group	1,755	42.5	291	30.5
Other	322	8.0	249	26.1
Total	4,130	100.0	953	100.0

Source: Twelfth Periodic Survey of Physicians. March 1978. Center for Health Services Research and Development, American Medical Association.

shared the income of a group practice (Table V).[1] This finding is not unexpected since men were also more likely to work in a solo or group practice setting wherein fee-for-service and income-sharing arrangements are the most common methods by which a physician is paid. Women, on the other hand, were more likely to be reimbursed on a salary basis.

Male physicians worked more hours per week and more weeks per year on average than female physicians (Table VI). This finding is consistent across specialties, and the difference is statistically significant for almost every specialty.[2] Controlling for specialty distribution, males averaged 50.9 hours in their most recent complete work week, compared with an average of 43.7 hours for female physicians.[3] Similarly, males would have worked an average of 47.1 weeks in 1977, compared with an average of 45.9 weeks for females.

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[1] Physicians were asked to indicate the percentage of his or her 1977 net income from medical practice that was derived from each of the following sources: 1) revenue from own patients in a solo or "expense sharing only" practice arrangement, 2) salary, 3) share of practice income, and 4) other. The source from which the physician indicated the majority of his income was derived determined the physician's classification.

[2] For hours of work, only the difference between male and female anesthesiologists was not statistically significant. For weeks practiced, only the differences for surgeons and radiologists were not statistically significant. For income from medical practice, only the differences for surgeons and anesthesiologists were not significant.

[3] To control for differences in specialty distributions, both male and female physicians' mean for each specialty were weighted by the proportion of physicians (of both sexes) in the population of office-based physicians who practiced in that specialty.

Table V—Distribution of Male Respondents from Main Sample and Female Respondents from Oversample by Method of Reimbursement, 1978

	Distribution of Physicians			
	Male Physicians (Main Sample)		Female Physicians (Oversample)	
Method of Reimbursement	Number	Percent	Number	Percent
Fee-for-Service	2,285	59.3%	434	49.7%
Salary	957	24.8	342	39.2
Share of Practice Income	511	13.2	63	7.2
Other	103	2.7	34	3.9
Total	3,856	100.0	873	100.0

Source: Twelfth Periodic Survey of Physicians. March 1978. Center for Health Services Research and Development, American Medical Association.

INCOME FROM MEDICAL PRACTICE

Mean net income from medical practice also shows a similar sex differential. If the distribution of male and female physicians across specialty categories was identical, males would have earned an average of $62,700 in 1977. Female physicians would have earned an average of $43,700, roughly 70 percent of the mean income from medical practice for males. The difference between male and female physicians' incomes, unadjusted for specialty distribution, is even larger. This wider gap results from women being overrepresented in those specialties with lower mean incomes such as Pediatrics and Psychiatry.

Even after adjusting for specialty there exist several factors which may account for differences in male and female physicians' incomes. Women physicians earn less, in part, because they work fewer hours per week and fewer weeks per year. Also, a factor which usually cannot be precisely adjusted for is the effect that the higher frequency of work interruptions may have on female physicians' incomes.

If females worked the same number of hours per week and weeks per year as did males, the ratio of the weighted mean female physician income to male physician income increased from 70 percent to 83 percent. Why such a differential continues to exist is unclear. Some would argue that the differential reflects discrimination against female physicians. However, the differential may also be due to a number of variables such as differing levels of work experience or differences in the geographic and age distribution of male and female physicians.

Table VI—Mean Weekly Hours, Annual Weeks Worked, and Net Income from Medical Practice of Male Respondents from Main Sample and Female Respondents from Oversample by Specialty

Specialty	Mean Total Hours Practiced in Most Recent Complete Week		Mean Number of Weeks Practiced in 1977		Mean Net Income from Medical Practice in 1977	
	Male Phys.	Female Phys.	Male Phys.	Female Phys.	Male Phys.	Female Phys.
Gen./Family Practice	49.9	41.6	47.3	45.2	$51,400	$32,900
	(0.5)	(1.3)	(0.2)	(0.7)	(1,100)	(2,100)
Internal Medicine	53.2	46.0	47.2	46.7	62,300	37,200
	(0.5)	(1.6)	(0.2)	(0.8)	(1,300)	(3,100)
Surgery	53.3	47.7	47.0	46.4	74,200	60,600*
	(0.5)	(2.8)	(0.2)	(1.0)	(1,400)	(7,800)
Pediatrics	49.9	39.1	47.2	45.7	50,600	31,000
	(0.8)	(1.1)	(0.4)	(0.5)	(1,600)	(1,500)
Ob./Gynecology	51.7	42.0	47.7	45.5	71,500	41,900
	(0.9)	(1.7)	(0.3)	(0.9)	(2,900)	(3,100)
Radiology	48.0	41.2	47.1	47.7	78,000	56,200*
	(0.6)	(2.7)	(0.3)	(1.1)	(2,900)	(6,700)
Psychiatry	46.5	37.4	47.2	46.2	50,500	32,600
	(0.8)	(1.0)	(0.3)	(0.5)	(1,400)	(1,900)
Anesthesiology	50.8	47.6	46.1	43.6	67,500	59,600
	(1.0)	(1.7)	(0.5)	(1.2)	(2,900)	(5,000)
Other	46.6	41.9	46.7	44.5	57,100	38,400
	(0.7)	(1.4)	(0.3)	(0.8)	(1,700)	(2,300)
All Specialties**	50.9	43.7	47.1	45.9	62,700	43,700

*Fewer than 30 observations.

**The mean for all specialties is a weighted mean. The mean for each specialty was weighted by the proportion of physicians in the population of office-based physicians in that specialty.

Note: Standard error of the mean is in parentheses.

Source: Twelfth Periodic Survey of Physicians. March 1978. Center for Health Services Research and Development, American Medical Association.

With respect to work experience, it has been argued that women's wages are lower than men's, in part, because their labor force attachment is shorter and often discontinuous (Mincer and Polachek 1974). Since women have historically assumed a disproportionate share of family and household responsibilities, their perceived value as employees and their income is lower. The survey of female physicians permits us to examine in some detail the effect that interruptions have on income.

An insert, not mailed to male physicians, was mailed to physicians in the female oversample which asked whether the physician's medical career had ever been totally interrupted for a period of six consecutive months or more. Female physicians were also asked if they had ever restricted their medical practice career to part-time for a period of six consecutive months or more.

Table VII contains income information for female physicians who have worked full-time on a continuous basis and for females whose practices have either been totally interrupted or restricted to part-time for a period of six months or more. It is evident that income from medical practice is affected if work experience is interrupted for any length of time. Women physicians who have worked full-time continuously throughout their career had a specialty-adjusted mean net income of $45,400 compared with a mean of $34,900 for women physicians who have had a career interruption or have been restricted to part-time practice. Mean hours of work are similarly affected. Women physicians who were continuously employed full-time worked a weighted average of 47.0 hours per week and 46.9 weeks per year compared with a weighted average of 36.5 hours and 43.2 weeks for women who were not employed full-time.

Interestingly, correcting for age (the distribution of female respondents which was skewed toward the younger age categories relative to the male physician age distribution) had no noticeable effect on the mean income of women physicians. In addition, correcting for the fact that female respondents were more likely than males to locate in the large metropolitan areas had no noticeable effect on the mean. Clearly, more attention must be devoted to gaining a better understanding of the causes of the income differential between male and female physicians.

TRENDS OVER TIME

Data on male and female income from medical practice in 1972 were also collected by the American Medical Association's Center for Health Services Research and Development. Information on the mean net income from medical practice in 1972 for male and female physicians appears in the article by Kehrer (1976). In general, income differences between men and women physicians have decreased between 1972 and 1977.

Table VII—Female Physicians' Mean Net Income from Medical Practice by Specialty and Work Experience, 1977

Specialty	Female Physicians' Mean Net Income No Interruptions (N=386)	 **Interruptions (N=247)
General/Family Practice	$33,500 (2,400)	$25,400* (2,700)
Internal Medicine	43,200 (4,100)	24,100 (3,400)
Surgery	57,200* (8,500)	47,400* (17,200)
Pediatrics	32,700 (1,800)	26,200 (2,400)
Obstetrics-Gynecology	45,900 (3,600)	39,700* (5,600)
Radiology	58,200* (8,500)	46,300* (9,800)
Psychiatry	36,000 (2,800)	28,800 (2,600)
Anesthesiology	62,700* (5,800)	57,100* (9,400)
Other	44,900 (2,800)	32,800 (2,600)
All Specialties***	45,400	34,900

*Fewer than 30 observations.

**Physician indicates that at least once, her career has either been totally interrupted for a period of six months or restricted to part-time for a period of six months.

***The mean for all specialties is a weighted mean. The mean for each specialty was weighted by the proportion of physicians in the population of office-based physicians in that specialty.

Note: Standard error of the mean is in parentheses.

Source: Twelfth Periodic Survey of Physicians. March 1978. Center for Health Services Research and Development, American Medical Association.

Table VIII—Mean Net Income per Hour from Medical Practice by Specialty for Male and Female Physicians, 1972 and 1977

	Mean Net Income Per Hour, 1977		Mean Net Income Per Hour, 1972		Ratio of Female To Male Hourly Income (X 100)	
Specialty	Male Phys.	Female Phys.	Male Phys.	Female Phys.	1977	1972
Gen./Family Practice	$21.80	$17.50	$17.60	$11.20	80.3%	63.6%
Internal Medicine	24.80	17.30	18.90	12.10	69.8	64.0
Surgery	29.60	27.40	24.00	21.50	92.6*	89.6*
Pediatrics	21.50	17.30	18.30	12.00	80.5	65.6
Ob./Gynecology	29.00	21.90	22.70	17.30	75.5	76.2
Radiology	34.50	28.60	28.70	21.70	82.9*	75.6*
Psychiatry	23.00	18.90	18.50	15.30	82.2	82.7
Anesthesiology	28.80	28.70	21.60	16.30	99.7	75.5
Other	26.20	20.60	22.60	16.80	78.6	74.3
All Specialties**	26.20	21.80	20.80	15.70	83.2	75.5

*Fewer than 30 observations.

**The mean for all specialties is a weighted mean. The mean for each specialty was weighted by the proportion of physicians in the population of office-based physicians in that specialty.

Note: Standard error of the mean is in parentheses.

Sources: Twelfth Periodic Survey of Physicians. March 1978. Center for Health Services Research and Development, American Medical Association.

Kehrer (1976).

Table VIII contains information on the mean net income per hour from medical practice for male and female physicians in nine specialty categories over the 1972-1977 time period. The ratio of female hourly income to male hourly income increased from 75.5 percent in 1972 to 83.2 percent in 1977.

SUMMARY

This study examined differences in income from medical practice between male and female physicians, using data from the American Medical Association's Twelfth Periodic Survey of Physicians conducted in 1978. It was found that, even after adjusting for differences in specialty mix, male physicians were compensated at a higher annual level ($62,700 versus $43,700) than their female counterparts. The income differential may be explained, in part, on the basis of the shorter work week, fewer weeks worked per year, and a greater likelihood of discontinuous work histories of female physicians.

Male physicians worked 50.9 hours per week in 1978 compared with an average of 43.7 hours per week for female physicians. Further, male physicians worked 47.1 weeks per year compared with 45.9 for females. However, even if women had worked the same number of hours per week and weeks per year as did men, the mean income from medical practice for females would have been only 83 percent of the mean income for males (after accounting for specialty differences).

Another finding of this study is that differences in income between men and women physicians appear to be diminishing over time. The ratio of female hourly income to male hourly income increased from 75.5 percent in 1972 to 83.2 percent in 1977. Future research should be directed at monitoring the findings and trends outlined in this study and to gaining a better understanding of the causes of the male-female income differential. Finally, factors affecting the level of this differential over time should be examined.

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Part IV—Selected Tabulations

Physician Manpower

The AMAs Periodic Survey of Physicians, the results of which are reported in this volume, focuses on non-federal, office-based physicians practicing in the fifty states and the District of Columbia. The total population of physicians in the United States and Possessions includes many physicians outside this focus. Therefore, a description of the total physician population is essential. The data for this section are drawn primarily from the *AMA Physician Masterfile*. The *Masterfile* is a census of all physicians in the U.S. and Possessions and is believed to be the only comprehensive source of data on all active and inactive physicians. Some of the data presented in this section are unique to this volume. However, *Physician Distribution and Medical Licensure in the U.S., 1978* reports the *Masterfile* data extensively.

A partial list of the contents of the *Masterfile* includes data on the physician's activity, specialty, practice location, and location of medical training. The activity classification is especially important because it differentiates physicians who are involved in patient care from those who are not and differentiates between office-based and hospital-based practice. A particular activity classification depends upon how the greatest proportion of a physician's time is spent.

The six activity classifications used in this section are as follows:

I. Patient Care
    A. Office-Based Practice
    B. Hospital-Based Practice
        1. residents—all years
        2. full-time physician staff
II. Other Professional Activity
    A. Medical Teaching
    B. Administration
    C. Research
    D. Other
III. Not Classified
IV. Inactive
V. Address Unknown
VI. Temporary Foreign

Primary Characteristics

There were 437,486 physicians in the United States and Possessions as of December 31, 1978. Of the total physician population, 78.3% (342,714) were involved in patient care as their primary activity, 7.6% (33,097) of the total physician population were not involved principally in patient care, and 14.1% (61,675) of the total physician population were inactive, were not classified, or had no known address.

Of the 342,714 physicians involved in patient care activities, 70.0% (239,866) had an office-based practice and 30.0% (102,848) had a hospital-based practice. Nonpatient-care physicians fall into four major categories:

- medical teaching (7,025 physicians)
- administration (11,858 physicians)
- research (11,437 physicians)
- other (2,777 physicians)

Physicians specializing in Internal Medicine accounted for 16.7% (62,641) of the 375,811 physicians who were classified, active, and had known addresses. Other specialties with at least 5.0% of the total number of physicians in the above cateogry include:

- General Practice (56,197 physicians; 15.0%)
- General Surgery (32,059; 8.5%)
- Psychiatry (25,596; 6.8%)
- Pediatrics (24,545; 6.5%)
- Obstetrics and Gynecology (23,963; 6.4%)

Of the total number of physicians in the United States and Possessions, 52.8% (229,387) were less than 45 years old as of December 31, 1978. Also 10.4% (45,540) of the total number of physicians were women and 66.4% (30,248) of women physicians were less than 45 years old as of December 31, 1978.

There were 407,953 non-federal physicians with known addresses residing in the United States and Possessions as of December 31, 1978. Of this total 24.4% (95,235) resided in the states of California and New York. Seven states each had more than 15,000 physicians as of December 31, 1978. The number of physicians and the percentage of total U. S. physicians with known addresses for these seven states are as follows:

- California (52,194 physicians; 12.8%)
- New York (45,147; 11.6%)
- Pennsylvania (21,234; 5.4%)
- Illinois (19,592; 5.0%)
- Texas (19,070; 4.9%)
- Florida (17,740; 4.5%)
- Ohio (16,633; 4.3%)

There were 211,911 physicians certified by at least one of the twenty-two American Specialty Boards as of December 31, 1978. This represents 48.5% of the total number of physicians in the United States and Possessions on that date. In addition, 202,240 (46.2%) physicians are certified in only a single specialty. Board certification by female physicians (30.4%) and foreign medical school graduate physicians (33.2%) was less prevalent than for the total physician population.

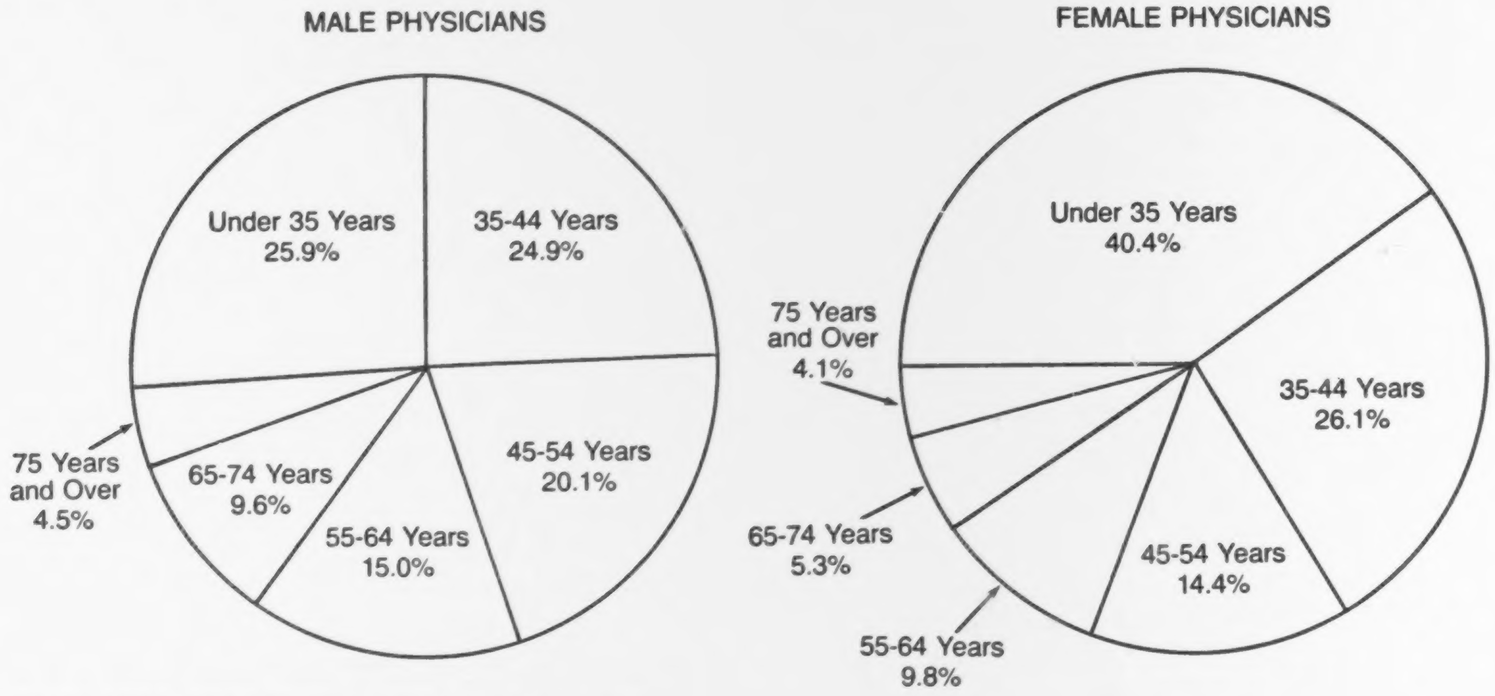
Table 1—Federal and Non-Federal Physicians by Age and Sex, December 31, 1978

Age	Total		Male		Female	
	Number	Percent	Number	Percent	Number	Percent
Total[a]	437,486	100.0 %	391,946	100.0 %	45,540	100.0 %
Under 35	120,021	27.4	101,638	25.9	18,383	40.4
35-44	109,376	25.0	97,511	24.9	11,865	26.1
45-54	85,424	19.5	78,855	20.1	6,569	14.4
55-64	63,353	14.5	58,898	15.0	4,455	9.8
65-74	39,952	9.1	37,539	9.6	2,413	5.3
75 and Over	19,360	4.4	17,505	4.5	1,855	4.1

[a] Excludes 5,843 Temporary Foreign.

Source: AMA Physician Masterfile, 1978. Special Tabulations. Center for Health Services Research and Development, American Medical Association.

Figure 1—Federal and Non-Federal Physicians by Age and Sex, December 31, 1978



Source: *AMA Physician Masterfile*, 1978. Special Tabulations. Center for Health Services Research and Development, American Medical Association.

Table 2—Federal and Non-Federal Physicians by Specialty and Activity, December 31, 1978

		Major Professional Activity							
		Patient Care				Other Professional Activity			
				Hosp. Based Practice					
Specialty	Total Physicians	Patient Care Total	Office Based Practice	Residents All Years	Full-Time Physician Staff	Medical Teaching	Adminis-tration	Research	Other
Total Physicians	437,486[a]	342,714	239,866	60,610	42,238	7,025	11,858	11,437	2,777
General Practice	56,197	54,893	45,408	5,804	3,681	303	695	75	231
Medical Spec.	109,743	96,940	64,860	20,719	11,361	2,782	3,081	6,470	470
Allergy	1,537	1,429	1,383	0	46	19	15	69	5
Cardiovas. Dis.	8,506	7,102	6,188	0	914	312	225	809	58
Dermatology	5,105	4,837	3,902	612	323	97	52	99	20
Gastroenterology	3,314	2,661	2,379	0	282	162	66	417	8
Internal Med.	62,641	55,540	33,772	15,244	6,524	1,280	1,822	3,730	269
Pediatrics	24,545	22,261	14,879	4,827	2,555	649	729	822	84
Ped. Allergy	437	376	340	12	24	13	4	43	1
Ped. Cardiology	588	437	302	24	111	53	28	68	2
Pulmonary Dis.	3,070	2,297	1,715	0	582	197	140	413	23

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Table 2—Continued

		Major Professional Activity							
		Patient Care				Other Professional Activity			
				Hosp. Based Practice					
Specialty	Total Physicians	Patient Care Total	Office Based Practice	Residents All Years	Full-Time Physician Staff	Medical Teaching	Adminis-tration	Research	Other
Surgical Specialties	102,414	98,567	73,640	17,385	7,542	1,215	1,181	1,149	302
Gen. Surgery	32,059	30,798	20,422	7,319	3,057	322	488	357	94
Neuro. Surg.	3,098	2,964	2,229	479	256	48	29	47	10
Ob./Gyn.	23,963	22,962	17,517	3,888	1,557	325	376	234	66
Ophthalmology	11,933	11,484	9,603	1,387	494	122	66	228	33
Ortho. Surgery	12,657	12,277	9,355	2,042	880	158	68	102	52
Otolaryngology	6,117	5,919	4,721	785	413	81	51	50	16
Plastic Surgery	2,624	2,549	2,088	335	126	36	11	24	4
Col. Rec. Surg.	679	662	616	24	22	2	3	10	2
Thoracic Surg.	2,042	1,908	1,480	206	222	33	51	43	7
Urological Surg.	7,242	7,044	5,609	920	515	88	38	54	18

(continued on following page)

Table 2—Continued

		Major Professional Activity							
		Patient Care				Other Professional Activity			
				Hosp. Based Practice					
Specialty	Total Physicians	Patient Care Total	Office Based Practice	Residents All Years	Full-Time Physician Staff	Medical Teaching	Administration	Research	Other
Other Specialties	107,457	92,314	55,958	16,702	19,654	2,725	6,901	3,743	1,774
Aerospace Med.	584	368	195	47	126	7	165	27	17
Anesthesiology	14,246	13,362	9,774	1,645	1,943	520	172	156	36
Child Psych.	2,926	2,403	1,736	227	440	135	227	127	34
Diag. Radiology	5,431	5,097	3,297	860	940	130	43	58	103
Forensic Path.	234	131	110	7	14	10	30	9	54
Neurology	4,923	4,157	2,553	991	613	218	99	407	42
Occup. Medicine	2,351	1,695	1,588	16	91	9	541	28	78
Psychiatry	25,596	22,770	14,175	3,533	5,062	500	1,705	472	149
Pathology	12,620	10,487	5,027	2,265	3,195	404	515	666	548
Phys. Med./Reh.	1,900	1,716	796	275	645	31	116	20	17

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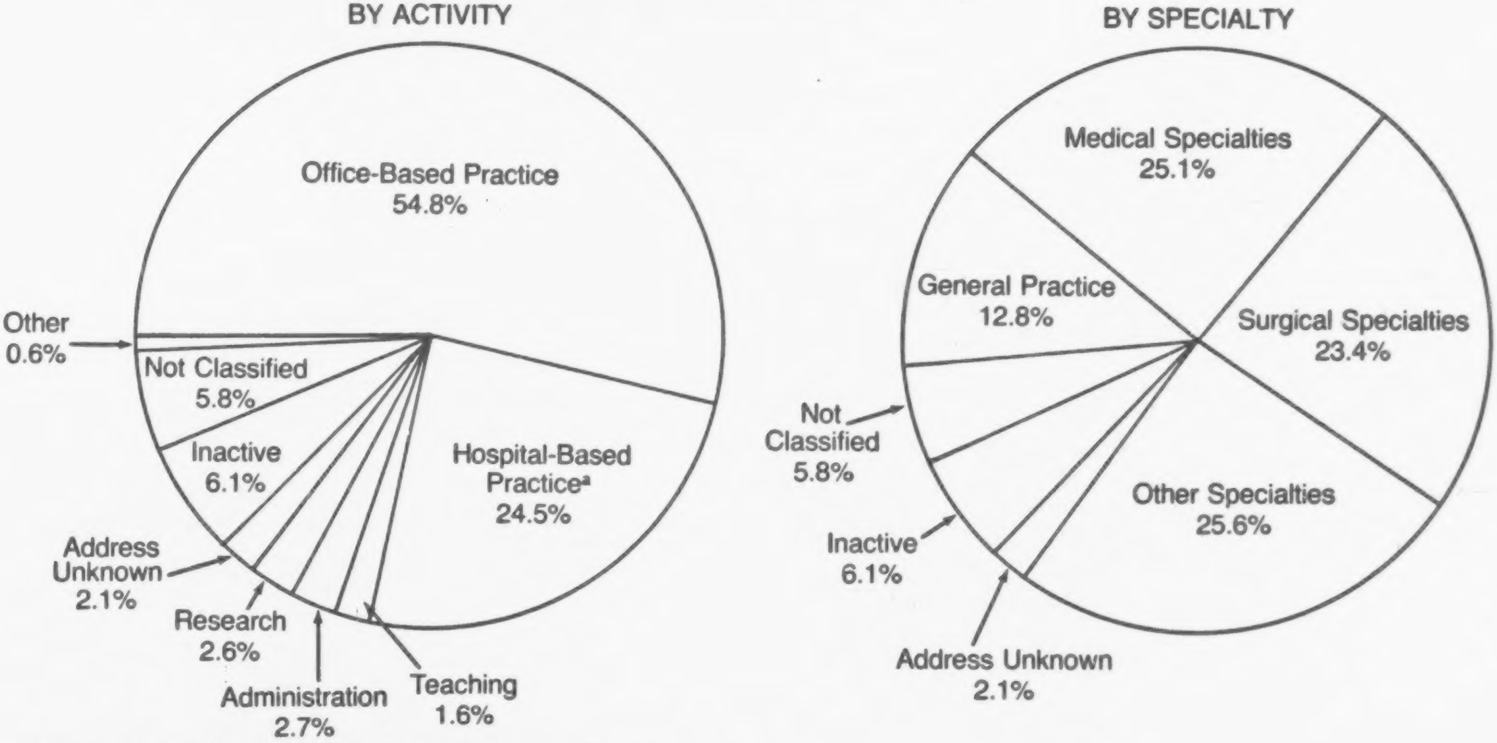
Table 2—Continued

		Major Professional Activity							
		Patient Care				Other Professional Activity			
				Hosp. Based Practice					
Specialty	Total Physicians	Patient Care Total	Office Based Practice	Residents All Years	Full-Time Physician Staff	Medical Teaching	Administration	Research	Other
Gen. Prev. Med.	756	367	236	64	67	34	254	71	30
Public Health	2,340	681	490	34	157	81	1,331	130	117
Radiology	11,579	10,820	7,261	1,422	2,137	217	138	194	210
Therapeutic Rad.	1,397	1,325	866	199	260	29	14	25	4
Other Specialty	10,136	7,120	4,923	0	2,197	337	1,276	1,163	240
Unspecified	10,438	9,815	2,931	5,117	1,767	63	275	190	95
Not Classified	25,553								
Inactive	26,831								
Address Unknown	9,291								

[a] Excludes 5,843 Temporary Foreign.

Source: Wunderman, Lorna E. Physician Distribution and Medical Licensure in the U.S., 1978. Chicago, Center for Health Services Research and Development, American Medical Association, 1979.

Figure 2—Federal and Non-Federal Physicians by Specialty and Activity, December 31, 1978



[a] Includes residents (all years) and full-time physician staff

Source: Wunderman, Lorna E. *Physician Distribution and Medical Licensure in the U.S., 1978.* Chicago, Center for Health Services Research and Development, American Medical Association, 1979.

Table 3—Federal and Non-Federal Physicians by Activity, December 31, 1978

Activity Specialty Group	Number	Federal		Non-Federal	
		Number	Percent	Number	Percent
Total Physicians[a]	375,811	20,242	5.4%	355,569	94.6%
Total Patient Care	342,714	16,931	4.9	325,783	95.1
General Practice	54,893	1,874	3.4	53,019	96.6
Medical Specialties	96,940	5,203	5.4	91,737	94.6
Surgical Specialties	98,567	4,039	4.1	94,528	95.9
Other Specialties	92,314	5,815	6.3	86,499	93.7
Medical Teaching	7,025	530	7.5	6,495	92.5
Administration	11,858	1,499	12.6	10,359	87.4
Research	11,437	1,071	9.4	10,366	90.6
Other	2,777	211	7.6	2,566	92.4

[a] Excludes 26,831 Inactive, 25,553 Not Classified, 9,291 Address Unknown, and 5,843 Temporary Foreign.

Note: Percentages may not add due to rounding.

Source: Wunderman, Lorna E. Physician Distribution and Medical Licensure in the U.S., 1978. Chicago, Center for Health Services Research and Development, American Medical Association, 1979.

Table 4—Federal and Non-Federal Physicians by Activity and Sex, December 31, 1978

Activity Specialty Group	Number	Females Number	Females Percent	Males Number	Males Percent
Total Physicians[a]	437,486	45,540	10.4%	391,946	89.6%
Total Patient Care	342,714	31,892	9.3	310,822	90.7
General Practice	54,893	3,656	6.7	51,237	93.3
Medical Specialties	96,940	11,979	12.4	84,961	87.6
Surgical Specialties	98,567	4,006	4.1	94,561	95.9
Other Specialties	92,314	12,251	13.3	80,063	86.7
Medical Teaching	7,025	900	12.8	6,125	87.2
Administration	11,858	1,113	9.4	10,745	90.6
Research	11,437	1,216	10.6	10,221	89.4
Other	2,777	357	12.9	2,420	87.1
Not Classified	25,553	4,198	16.4	21,355	83.6
Inactive	26,831	3,645	13.6	23,186	86.4
Address Unknown	9,291	2,219	23.9	7,072	76.1

[a] Totals exclude 5,843 Temporary Foreign.

Source: AMA Physician Masterfile, 1978. Special Tabulations. Center for Health Services Research and Development, American Medical Association.

Table 5—Federal and Non-Federal Physicians by Activity and Country of Medical School, December 31, 1978

Activity	Total		U. S. Medical School		Canadian Medical School		Foreign Medical School	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total[a]	437,486	100.0	339,114	100.0	7,021	100.0	91,351	100.0
Total Patient Care	342,714	78.3	269,195	79.4	4,771	68.0	68,768	75.3
Office-Based Practice	239,866	54.8	193,698	57.1	4,056	57.8	42,113	46.1
Hospital-Based Practice:								
Residents	60,610	13.9	48,460	14.3	209	3.0	11,941	13.1
Full Time Physician Staff	42,238	9.7	27,017	8.0	506	7.2	14,715	16.1
Other Professional Activities:								
Medical Teaching	7,025	1.6	5,515	1.6	148	2.1	1,362	1.5
Administration	11,858	2.7	10,136	3.0	264	3.8	1,458	1.6
Research	11,437	2.6	7,953	2.3	227	3.2	3,257	3.6
Other	2,777	0.6	2,130	0.6	70	1.0	577	0.6
Not Classified	25,553	5.8	15,879	4.7	369	5.3	9,305	10.2
Inactive	26,831	6.1	23,571	7.0	599	8.5	2,661	2.9
Address Unknown	9,291	2.1	4,755	1.4	573	8.2	3,963	4.3

[a] Excludes 5,843 Temporary Foreign.

Source: AMA Physician Masterfile, 1978. Special Tabulations. Center For Health Services Research and Development, American Medical Association.

Table 6—Federal and Non-Federal Physicians by Specialty, Activity and Sex, December 31, 1978

	Total Physicians		Females		Males	
Specialty	Patient Care	Other Professional Activity	Patient Care	Other Professional Activity	Patient Care	Other Professional Activity
Total Physicians[a]	342,714	33,097	31,892	3,586	310,822	29,511
General Practice	54,893	1,304	3,656	122	51,237	1,182
Medical Spec.	96,940	12,803	11,979	1,520	84,961	11,283
Allergy	1,429	108	109	7	1,320	101
Cardiovas. Dis.	7,102	1,404	180	73	6,922	1,331
Dermatology	4,837	268	459	25	4,378	243
Gastroenterology	2,661	653	50	20	2,611	633
Internal Med.	55,540	7,101	5,208	685	50,332	6,416
Pediatrics	22,261	2,284	5,699	617	16,562	1,667
Ped. Allergy	376	61	53	12	323	49
Ped. Cardiology	437	151	83	24	354	127
Pulmonary Dis.	2,297	773	138	57	2,159	716

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Table 6—Continued

Specialty	Total Physicians		Females		Males	
	Patient Care	Other Professional Activity	Patient Care	Other Professional Activity	Patient Care	Other Professional Activity
Surgical Specialties	98,567	3,847	4,006	194	94,561	3,653
Gen. Surgery	30,798	1,261	839	27	29,959	1,234
Neuro. Surgery	2,964	134	30	1	2,934	133
Obst./Gynecology	22,962	1,001	2,357	119	20,605	882
Ophthamology	11,484	449	484	32	11,000	417
Ortho. Surgery	12,277	380	84	6	12,193	374
Otolaryngology	5,919	198	91	4	5,828	194
Plastic Surgery	2,549	75	82	3	2,467	72
Col. Rec. Surgery	662	17	6	0	656	17
Thoracic Surgery	1,908	134	8	1	1,900	133
Urological Surgery	7,044	198	25	1	7,019	197

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Table 6—Continued

Specialty	Total Physicians		Females		Males	
	Patient Care	Other Professional Activity	Patient Care	Other Professional Activity	Patient Care	Other Professional Activity
Other Specialties	92,314	15,143	12,251	1,750	80,063	13,393
Aerospace Med.	368	216	6	1	362	215
Anesthesiology	13,362	884	1,871	169	11,491	715
Child Psych.	2,403	523	651	124	1,752	399
Diag. Radiology	5,097	334	349	29	4,748	305
Forensic Path.	131	103	14	8	117	95
Neurology	4,157	766	392	59	3,765	707
Occup. Medicine	1,695	656	71	28	1,624	628
Psychiatry	22,770	2,826	3,468	285	19,302	2,541
Pathology	10,487	2,133	1,716	268	8,771	1,865
Phys. Med./Reh.	1,716	184	392	26	1,324	158

(continued on following page)

Table 6—Continued

Specialty	Total Physicians		Females		Males	
	Patient Care	Other Professional Activity	Patient Care	Other Professional Activity	Patient Care	Other Professional Activity
Gen. Prev. Med.	367	389	54	46	313	343
Public Health	681	1,659	165	305	516	1,354
Radiology	10,820	759	737	68	10,083	691
Therapeutic Rad.	1,325	72	142	5	1,183	67
Other Specialty	7,120	3,016	601	243	6,519	2,773
Unspecified	9,815	623	1,622	86	8,193	537

[a] Excludes 26,831 Inactive, 25,553 Not Classified, 9,291 Address Unknown, and 5,843 Temporary Foreign.

Source: Wunderman, Lorna E. *Physician Distribution and Medical Licensure in the U. S., 1978*. Chicago, Center for Health Services Research and Development, American Medical Association, 1979.

Table 7—Non-Federal Physicians by State and Activity, December 31, 1978

		Major Professional Activity							
		Patient Care				Other Professional Activity			
				Hosp. Based Practice					
Specialty	Total Physicians	Patient Care Total	Office Based Practice	Residents All Years	Full-Time Physician Staff	Medical Teaching	Adminis-tration	Research	Other
Total[a]	407,953	325,783	238,943	57,205	29,635	6,495	10,359	10,366	2,566
Alabama	4,554	3,833	2,981	645	207	86	83	116	21
Alaska	460	378	349	9	20	4	12	5	0
Arizona	4,918	3,732	2,847	629	256	84	98	57	33
Arkansas	2,610	2,165	1,749	294	122	47	46	23	16
California	52,194	41,296	32,754	5,752	2,790	797	1,295	1,282	382
Canal Zone	42	36	7	23	6	0	2	0	0
Colorado	5,600	4,548	3,454	798	296	94	152	132	33
Connecticut	7,705	6,054	4,098	1,294	662	119	278	270	55
Delaware	972	805	601	119	85	8	32	9	3
Dist. of Columbia	3,491	2,576	1,626	725	225	125	198	122	24
Florida	18,353	13,584	10,990	1,557	1,037	229	316	260	126
Georgia	7,259	6,090	4,691	975	424	135	156	105	28
Hawaii	1,808	1,447	1,154	198	95	28	53	29	14
Idaho	1,010	847	780	23	44	5	20	6	6
Illinois	20,628	16,602	11,856	2,760	1,986	325	524	513	134

(continued on following page)

Table 7—Continued

		Major Professional Activity							
		Patient Care				Other Professional Activity			
				Hosp. Based Practice					
Specialty	Total Physicians	Patient Care Total	Office Based Practice	Residents All Years	Full-Time Physician Staff	Medical Teaching	Adminis-tration	Research	Other
Indiana	6,993	5,807	4,614	806	387	91	146	113	49
Iowa	3,635	3,035	2,355	548	132	74	57	86	15
Kansas	3,618	2,938	2,197	505	236	61	74	65	26
Kentucky	4,699	3,873	2,946	704	223	86	82	84	22
Louisiana	5,955	4,833	3,615	655	663	110	119	108	40
Maine	1,752	1,378	1,111	139	128	13	40	19	11
Maryland	10,390	7,808	5,207	1,731	870	194	374	493	80
Massachusetts	14,985	11,517	7,703	2,396	1,418	216	441	865	92
Michigan	14,290	11,688	8,164	2,535	989	228	358	290	73
Minnesota	7,676	6,369	4,371	1,631	367	134	136	201	43
Mississippi	2,571	2,179	1,781	254	144	31	29	26	15
Missouri	7,839	6,150	4,315	1,194	641	158	177	286	42
Montana	1,024	878	818	14	46	0	11	10	9
Nebraska	2,338	1,898	1,442	389	67	66	61	31	9
Nevada	925	758	701	11	46	3	25	10	8
New Hampshire	1,542	1,190	962	145	83	17	38	36	12

(continued on following page)

Table 7—Continued

		Major Professional Activity							
		Patient Care				Other Professional Activity			
				Hosp. Based Practice					
Specialty	Total Physicians	Patient Care Total	Office Based Practice	Residents All Years	Full-Time Physician Staff	Medical Teaching	Adminis-tration	Research	Other
New Jersey	13,820	11,029	7,987	1,720	1,322	116	414	275	97
New Mexico	1,869	1,434	1,116	200	118	34	54	36	12
New York	47,021	36,307	23,282	7,788	5,237	747	1,544	1,660	288
North Carolina	8,428	6,777	5,067	1,197	513	173	228	277	43
North Dakota	825	707	608	59	40	11	17	3	4
Ohio	17,325	14,477	10,220	3,069	1,188	242	357	324	90
Oklahoma	3,650	3,120	2,424	465	231	60	74	41	18
Oregon	4,546	3,615	2,965	441	209	69	92	85	40
Pennsylvania	22,149	17,883	12,335	3,645	1,903	358	589	607	148
Puerto Rico	3,543	2,764	1,758	312	694	67	97	35	20
Rhode Island	1,967	1,609	1,120	271	218	27	51	46	9
South Carolina	3,873	3,159	2,342	592	225	70	105	45	17
South Dakota	723	611	509	69	33	9	14	2	4
Tennessee	6,808	5,614	4,073	1,156	385	121	154	142	39
Texas	20,143	16,540	12,619	2,957	964	373	415	504	114
Utah	2,225	1,829	1,388	357	84	43	52	56	15

(continued on following page)

Table 7—Continued

		Major Professional Activity							
		Patient Care				Other Professional Activity			
				Hosp. Based Practice					
Specialty	Total Physicians	Patient Care Total	Office Based Practice	Residents All Years	Full-Time Physician Staff	Medical Teaching	Adminis-tration	Research	Other
Vermont	1,075	841	614	161	66	21	29	36	6
Virginia	8,653	6,958	5,193	1,227	538	142	218	714	60
Virgin Islands	91	69	43	3	23	0	4	0	1
Washington	6,981	5,553	4,476	799	278	90	192	181	48
West Virginia	2,565	2,123	1,556	322	245	43	58	24	20
Wisconsin	7,271	5,999	4,592	1,026	381	109	149	158	49
Wyoming	479	394	353	10	31	2	15	2	3
Pacific Islands	87	79	64	1	14	0	4	1	0

[a] Total includes 25,553 Not Classified, and 26,831 Inactive; excludes 5,843 Temporary Foreign and 9,291 Address Unknown.

Source: Wunderman, Lorna E. Physician Distribution and Medical Licensure in the U.S., 1978. Chicago, Center for Health Services Research and Development, American Medical Association, 1979.

Table 8—Number and Percentage of Board Certified Physicians by Sex and Country of Medical School, December 31, 1978

			Sex		Country of Medical School		
Number of Board Certifications as of December 31, 1978	Total Number	Total Percent	Female Percent	Male Percent	U. S. Medical School Percent	Canadian Medical School Percent	Foreign Medical School Percent
Total[a]	437,486	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Not Board Certified	225,495	51.5	69.6	49.4	47.5	49.7	66.8
1 Certification	202,240	46.2	29.5	48.2	50.1	48.1	31.8
2 Certifications	9,692	2.2	0.9	2.4	2.4	2.2	1.5
3 Certifications	59	0.0	0.0	0.0	0.0	0.0	0.0

[a] Excludes 5,843 Temporary Foreign.

Source: AMA Physician Masterfile, 1978. Special Tabulations. Center for Health Services Research and Development, American Medical Associaton.

Foreign Medical Graduates

There were 91,351 foreign medical graduates in the United States and Possessions as of December 31, 1978. This accounted for 20.9% of the total physician population at that time. Of the foreign medical graduates, 75.3% (68,768) were engaged in patient care as their principal activity. In addition, 7.3% (6,654) were not engaged in patient-care activities, and 17.4% (15,929) were either inactive, not classified, or had no known address.

Of the 68,768 foreign medical graduates involved in patient-care activities, 61.2% (42,112) had an office-based practice and 38.8% (26,656) had a hospital-based practice. Nonpatient-care physicians are divided into four categories:

- medical teaching (1,362 physicians)
- administration (1,458 physicians)
- research (3,257 physicians)
- other (577 physicians)

Eight specialties each had more than 5.0% of the 75,422 foreign medical graduates who were active, classified, and had a known address. These eight specialties, accounting for 70.5% (53,159) of the total, include:

- Internal Medicine (11,518; 15.3%)
- General Practice (8,722; 11.6%)
- General Surgery (6,692; 8.9%)
- Psychiatry (6,438; 8.5%)
- Pediatrics (5,650; 7.5%)
- Anesthesiology (5,390; 7.1%)
- Obstetrics and Gynecology (4,803; 6.4%)
- Pathology (3,946; 5.2%)

Foreign medical graduates have received their education in many different countries. However, two countries, India and the Philippines, provided the largest numbers of foreign medical graduates. These two countries accounted for 27.9% (25,451) of the total number of foreign medical graduates as of December 31, 1978.

Table 9—Thirty Foreign Countries Contributing the Largest Number of Physicians, December 31, 1978

Country	Total	Country	Total
India	13,444	Thailand	1,403
Philippines	12,007	Austria	1,388
Korea[a]	4,079	Colombia	1,364
Germany[b]	4,046	Ireland	1,330
Mexico	3,996	Greece	1,088
Italy	3,854	Turkey	1,027
Cuba	3,540	Lebanon	993
United Kingdom[c]	3,157	Peru	970
Spain	3,002	Dominican Republic	908
Switzerland	2,495	Belgium	877
Iran	2,478	Poland	872
Taiwan (Formosa)	2,136	Japan	849
Pakistan	1,930	France	846
Argentina	1,922	Hungary	825
UAR (Egypt)	1,449	South Africa	824
		Total of Largest 30 Countries	79,099
		All Others	12,252
		Total	91,351

[a] Korea includes North and South Korea. [b] Germany includes East and West Germany. [c] United Kingdom includes England, Scotland, Wales, and North Ireland.

Source: AMA Physician Masterfile, 1978. Special Tabulation. Center For Health Services Research and Development.

Table 10—Foreign Medical Graduates in the United States and Possessions by Specialty and Activity, December 31, 1978

		Major Professional Activity							
		Patient Care				Other Professional Activity			
				Hosp. Based Practice					
Specialty	Total Physicians	Patient Care Total	Office Based Practice	Residents All Years	Full-Time Physician Staff	Medical Teaching	Administration	Research	Other
Total Physicians	91,351[a]	68,768	42,112	11,941	14,715	1,362	1,458	3,257	577
Gen. Practice	8,722	8,527	6,591	683	1,253	30	94	19	52
Medical Spec.	21,362	18,913	12,202	3,041	3,670	423	284	1,654	88
Allergy	190	173	168	0	5	2	1	14	0
Cardiovas. Dis.	1,934	1,576	1,226	0	350	63	22	258	15
Dermatology	442	407	341	34	32	15	3	16	1
Gastroenterology	645	488	407	0	81	25	10	121	1
Internal Med.	11,518	10,291	6,278	2,041	1,972	186	146	848	47
Pediatrics	5,650	5,206	3,272	951	983	96	70	262	16
Ped. Allergy	70	60	48	5	7	1	0	9	0
Ped. Cardiology	174	129	86	10	33	11	7	26	1
Pulmonary Dis.	739	583	376	0	207	24	25	100	7

(continued on following page)

Table 10—Continued

		Major Professional Activity							
		Patient Care				Other Professional Activity			
				Hosp. Based Practice					
Specialty	Total Physicians	Patient Care Total	Office Based Practice	Residents All Years	Full-Time Physician Staff	Medical Teaching	Administration	Research	Other
Surgical Specialties	17,598	16,805	11,098	3,501	2,206	208	116	407	62
Gen. Surgery	6,692	6,442	3,633	1,768	1,041	44	37	141	28
Neuro. Surg.	537	516	333	118	65	8	1	12	0
Ob./Gyn.	4,803	4,575	3,235	776	564	75	47	88	18
Ophthalmology	1,062	977	810	92	75	18	10	53	4
Ortho. Surgery	1,352	1,293	906	254	133	18	4	28	9
Otolaryngology	885	834	611	137	86	12	6	31	2
Plastic Surgery	413	400	306	65	29	4	0	9	0
Col. Rec. Surg.	109	103	92	7	4	0	1	5	0
Thoracic Surg.	454	427	322	50	55	4	4	18	1
Urological Surg.	1,291	1,238	850	234	154	25	6	22	0

(continued on following page)

Table 10—Continued

		Major Professional Activity							
		Patient Care				Other Professional Activity			
				Hosp. Based Practice					
Specialty	Total Physicians	Patient Care Total	Office Based Practice	Residents All Years	Full-Time Physician Staff	Medical Teaching	Administration	Research	Other
Other Specialties	27,740	24,523	12,221	4,716	7,586	701	964	1,177	375
Aerospace Med.	46	32	14	4	14	2	5	5	2
Anesthesiology	5,390	5,088	3,327	733	1,028	163	39	83	17
Child Psych.	692	586	330	87	169	22	31	43	10
Diag. Radiology	1,036	957	490	170	297	21	11	26	21
Forensic Path.	66	41	33	4	4	1	9	6	9
Neurology	1,060	900	477	216	207	51	12	89	8
Occup. Medicine	220	181	162	4	15	1	22	6	10
Psychiatry	6,438	5,865	2,531	1,041	2,293	93	340	114	26
Pathology	3,946	3,306	1,285	740	1,281	148	106	262	124
Phys. Med./Rehab.	845	799	269	177	353	10	24	9	3

(continued on following page)

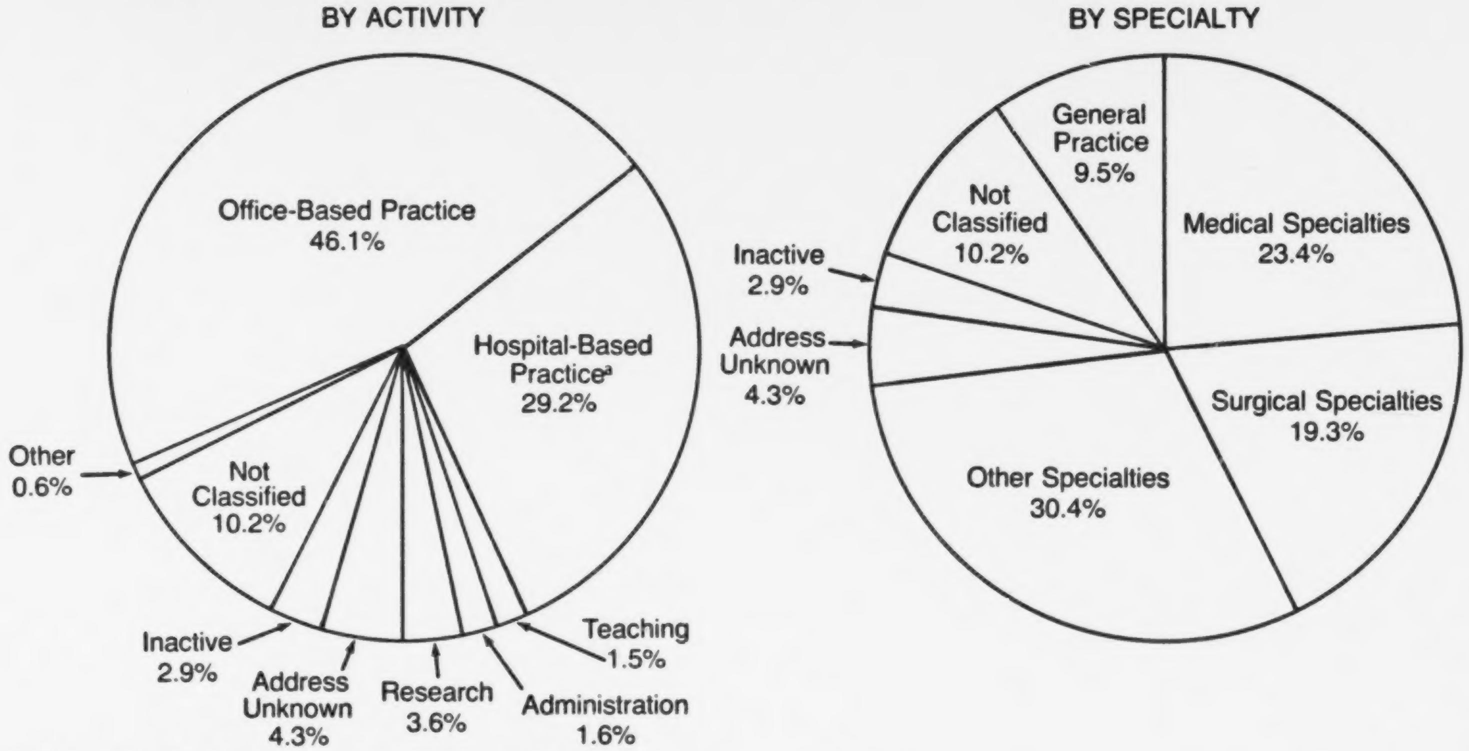
Table 10—Continued

		Major Professional Activity							
		Patient Care				Other Professional Activity			
				Hosp. Based Practice					
Specialty	Total Physicians	Patient Care Total	Office Based Practice	Residents All Years	Full-Time Physician Staff	Medical Teaching	Administration	Research	Other
Gen. Prev. Med.	88	48	35	8	5	8	22	10	0
Public Health	277	106	86	3	17	12	113	25	21
Radiology	2,117	1,914	936	415	563	55	18	87	43
Therapeutic Rad.	442	421	203	101	117	7	3	11	0
Other Specialty	1,971	1,430	779	0	651	72	131	305	33
Unspecified	3,106	2,849	1,264	1,013	572	35	78	96	48
Not Classified	9,305								
Inactive	2,661								
Address Unknown	3,963								

[a] Excludes 2,380 Temporary Foreign.

Source: Wunderman, Lorna E. Physician Distribution and Medical Licensure in the U.S., 1978. Chicago, Center for Health Services Research and Development, American Medical Association, 1979.

Figure 3—Federal and Non-Federal Foreign Medical Graduates in United States and Possessions by Specialty and Activity, December 31, 1978



[a] Includes residents (all years) and full-time physician staff

Source: Wunderman, Lorna E. *Physician Distribution and Medical Licensure in the U.S., 1978.* Chicago, Center for Health Services Research and Development, American Medical Association, 1979.

Physician-Population Ratios

In 1978 there were 186 total physicians per 100,000 persons in the United States and 148 patient-care physicians per 100,000 persons. Five states and the District of Columbia had more than 180 patient-care physicians per 100,000 persons:

- District of Columbia (387)
- New York (205)
- Massachusetts (200)
- Connecticut (196)
- Maryland (190)
- California (188)

States with fewer than 100 patient-care physicians per 100,000 persons include:

- South Dakota (89)
- Mississippi (91)
- Wyoming (94)
- Idaho (97)
- Arkansas (99)

From 1969 to 1978, the total number of non-federal physicians and the physician-to-population ratios have increased. The total number of non-federal physicians increased 38.9% to 404,190 and the number of patient care physicians increased 31.6% to 322,835. Also, the total number of non-federal physicians per 100,000 persons increased 28.3% and the number of patient-care physicians per 100,000 persons increased 21.3% between 1969 and 1978.

Characteristics of Medical Practice

The data presented in this section were obtained from the AMA's Thirteenth Periodic Survey of Physicians (PSP13). This essentially annual survey, conducted by the AMA Center for Health Services Research and Development, was initiated in 1966. PSP13 questionnaires were mailed to a stratified random sample of 10,000 nonfederal, office-based physicians in the United States drawn from the AMA Physician Masterfile. This survey yielded a usable sample of approximately 4,500 physicians. A copy of the questionnaire appears in the Appendix to this volume.

SAMPLE SELECTION

The PSP sample is selected from an "office-based" subset of the entire population of United States physicians in the Masterfile. The office-based physicians comprising this subset report spending the greatest proportion of their hours in direct patient care in either a solo, partnership, group practice, or other medical care setting. Only hospital residents and those patient-care physicians who report that a plurality of their professional hours are spent as full-time salaried hospital staff are excluded from this office-based category. Other major categories of physicians excluded from the population from which the PSP sample is drawn include:

- federally-employed physicians;
- doctors of Osteopathy;
- graduates of foreign medical schools who are only temporarily licensed to practice in the U.S.;
- physicians for whom no current address is available; and
- physicians who were included in the sample for the preceeding PSP.

To classify physicians into the categories listed above, the Masterfile is updated by a triennial census and a computerized weekly updating system. The weekly updates may be signaled by information obtained from AMA mailings, physician correspondence, hospitals, government agencies, specialty boards, and licensing agencies. Any indication of a change in professional status or address triggers a questionnaire similar to the one used in the latest census year.

The annual Periodic Survey of Physicians is currently based on a single-stage, stratified sample with systematic selection from the population described above. Stratification is by specialty. Hence, following an initial random sort, a secondary sort of specialty category, and a random start, a systematically selected sample of 10,000 physicians, proportional to the size of the specialty strata, is obtained. The sample drawn represents approximately five percent of the nonfederal, office-based physicians practicing throughout the United States. The nine major specialty categories used in the sample selection procedure for the PSP are described below.

A final check consists of a comparison of the PSP population's and the sample's frequency distribution on the basis of specialty, age, sex, and geographic location. Chi-square analyses are performed as a test for significance of differences between the distribution of the sample and the population. If the sample does not proportionately represent the population of the non-federal, office-based physicians, a new sample is selected.

DATA COLLECTION AND FILE CONSTRUCTION

An initial mailing of 10,000 questionnaires took place at the end of March 1979. Five follow-up questionnaires were mailed to nonrespondents at monthly intervals. When the survey was closed in September 197~~8~~9, 4,499 usable questionnaires had been returned.

The response rate for PSP13 was over fifty percent. Response rate is determined by dividing the number of questionnaires received from eligible physicians by the number of eligible physicians included in the sample. Despite continual updating, the AMA Physician Masterfile contains some ineligible physicians, and some of these ineligible physicians receive a questionnaire. Ineligible physicians could include recent retirees, physicians temporarily not in practice or out of the country, or physicians who have recently changed from office-based patient-care practice to another professional activity.

Nonresponse bias is a potential problem in all surveys, particularly when the response rate is on the order of fifty percent, as has been the recent experience of the Periodic Survey of Physicians. If the work patterns and practice characteristics of nonrespondents differ significantly from respondents, then the estimates obtained through PSP13 may be biased in one direction or another. The extent of the bias, if it exists, is difficult to assess unless work patterns and practice characteristics of nonrespondents can be ascertained. However, it is possible to compare certain demographic characteristics of respondents with the original population to determine if under-reporting of certain groups has occurred. Comparisons of sample respondents with the population of office-based, patient-care physicians on the basis of specialty, location, age, and sex are presented in Table I through Table IV.

All questionnaires were reviewed and edited prior to keypunching. After the data for PSP13 were keypunched, a series of computer edits were performed. Any errors detected by this process were verified against the original questionnaires and appropriate modifications or deletions were made.

Following the editing and verification procedures, the raw data were linked with biographic information on each physician from the Masterfile as well as demographic information on the geographic area in which the physician practices. Confidentiality is assured since all identifiers (names, addresses, medical education numbers) are erased once the necessary computer links have been accomplished.

Table I—Distribution by Specialty of the Population and Respondents to the Thirteenth Periodic Survey of Physicians

Specialty Group	Population		Respondents	
	No.	%	No.	%
General/Family Practice	44,051	19.1%	892	19.8%
Internal Medicine	41,279	17.9	806	17.9
Surgery	54,670	23.7	1,026	22.8
Pediatrics	14,522	6.3	292	6.5
Obstetrics-Gynecology	16,915	7.3	332	7.4
Radiology	11,109	4.8	211	4.7
Psychiatry	15,403	6.7	332	7.4
Anesthesiology	9,443	4.1	166	3.7
Other	23,021	10.0	442	9.8
Total	230,413	100.0	4,499	100.0

Table II—Distribution by Census Division of the Population and Respondents to the Thirteenth Periodic Survey of Physicians

Census Division	Population		Respondents	
	No.	%	No.	%
New England	14,543	6.3%	274	6.1%
Middle Atlantic	42,116	18.3	790	17.6
East North Central	38,073	16.5	728	16.2
West North Central	15,293	6.6	321	7.1
South Atlantic	36,359	15.8	722	16.0
East South Central	11,635	5.0	222	4.9
West South Central	20,065	8.7	357	7.9
Mountain	11,209	4.9	252	5.6
Pacific	41,120	17.8	833	18.5
Total	230,413	100.0	4,499	100.0

Table 11—Non-Federal Physicians, Civilian Population, Physician-Population Ratios and Rank by State, 1978

State	Civilian Population (7-1-78)	Non-Federal Physicians (12-31-78)		Physicians Per 100,000 Population		Rank of Physician-Population Ratio By State	
		Total	Patient Care	Total	Patient Care	Total	Patient Care
Alabama	3,719,000	4,554	3,833	122	103	45	45
Alaska	379,000	460	378	121	100	46	46
Arizona	2,327,000	4,918	3,732	211	160	11	11
Arkansas	2,176,000	2,610	2,165	120	99	47	47
California	22,021,000	52,194	41,296	237	188	6	6
Colorado	2,626,000	5,600	4,548	213	173	10	7
Connecticut	3,084,000	7,705	6,054	250	196	5	4
Delaware	577,000	972	805	168	140	22	20
D.C.	666,000	3,491	2,576	524	387	1	1
Florida	8,499,000	18,353	13,584	216	160	8	12
Georgia	5,024,000	7,259	6,090	144	121	35	34
Hawaii	838,000	1,808	1,447	216	173	9	10
Idaho	872,000	1,010	847	116	97	48	48
Illinois	11,205,000	20,628	16,602	184	148	18	17
Indiana	5,368,000	6,993	5,807	130	108	41	43
Iowa	2,895,000	3,635	3,035	126	105	44	44
Kansas	2,323,000	3,618	2,938	156	126	29	30
Kentucky	3,464,000	4,699	3,873	136	112	39	39
Louisiana	3,934,000	5,955	4,833	151	123	33	32

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Table 11—Continued

State	Civilian Population (7-1-78)	Non-Federal Physicians (12-31-78)		Physicians Per 100,000 Population		Rank of Physician-Population Ratio By State	
		Total	Patient Care	Total	Patient Care	Total	Patient Care
Maine	1,081,000	1,752	1,378	162	127	23	27
Maryland	4,100,000	10,390	7,808	253	190	4	5
Massachusetts	5,761,000	14,985	11,517	260	200	3	3
Michigan	9,178,000	14,290	11,688	156	127	30	28
Minnesota	4,006,000	7,676	6,369	192	159	13	13
Mississippi	2,383,000	2,571	2,179	108	91	50	50
Missouri	4,840,000	7,839	6,150	162	127	24	29
Montana	779,000	1,024	878	131	113	40	38
Nebraska	1,553,000	2,338	1,898	151	122	34	33
Nevada	651,000	925	758	142	116	36	36
New Hampshire	867,000	1,542	1,190	178	137	19	22
New Jersey	7,303,000	13,820	11,029	189	151	14	15
New Mexico	1,196.000	1,869	1,434	156	120	28	35
New York	17,722,000	47,021	36,307	265	205	2	2
North Carolina	5,478,000	8,428	6,777	154	124	32	31
North Dakota	640,000	825	707	129	110	42	41
Ohio	10,736,000	17,325	14,477	161	135	25	23
Oklahoma	2,852,000	3,650	3,120	128	109	43	42
Oregon	2,440,000	4,546	3,615	186	148	17	18

(continued on following page)

Table 11—Continued

State	Civilian Population (7-1-78)	Non-Federal Physicians (12-31-78)		Physicians Per 100,000 Population		Rank of Physician-Population Ratio By State	
		Total	Patient Care	Total	Patient Care	Total	Patient Care
Pennsylvania	11,740,000	22,149	17,883	189	152	15	14
Rhode Island	931,000	1,967	1,609	211	173	12	8
South Carolina	2,852,000	3,873	3,159	136	111	38	40
South Dakota	683,000	723	611	106	89	51	51
Tennessee	4,336,000	6,808	5,614	157	129	26	24
Texas	12,869,000	20,143	16,540	157	129	27	25
Utah	1,302,000	2,225	1,829	171	140	21	19
Vermont	487,000	1,075	841	221	173	7	9
Virginia	4,994,000	8,653	6,958	173	139	20	21
Washington	3,722,000	6,981	5,553	188	149	16	16
West Virginia	1,859,000	2,565	2,123	138	114	37	37
Wisconsin	4,677,000	7,271	5,999	155	128	31	26
Wyoming	420,000	479	394	114	94	49	49

Source: Wunderman, Lorna E. Physician Distribution and Medical Licensure in the U. S., 1978. Chicago, Center for Health Research and Development, American Medical Association, 1979.

Table 12—Non-Federal Physicians, Civilian Population, and Physician-Population Ratios, 1969 to 1978

Year	Civilian Population As of January 1 Following Year	Non-Federal Physicians As Of December 31		Physicians Per 100,000 Population	
		Total	Patient Care	Total	Patient Care
1969	200,466,000	290,942	245,368	145	122
1970	203,109,000	298,745	252,778	147	124
1971	205,496,000	309,685	261,335	151	127
1972	207,306,000	322,836	266,587	156	129
1973	208,951,000	331,070	270,412	158	129
1974	210,555,000	342,611	276,070	163	131
1975	212,308,000	356,560	285,345	168	134
1976	213,889,000	369,794	292,152	173	137
1977	215,620,000	386,787	312,872	179	145
1978	217,435,000	404,190	322,835	186	148

[a] Excludes physicians in Possessions (Canal Zone, Pacific Islands, Puerto Rico, and Virgin Islands).

Source: Physician Data from various issues of Distribution of Physicians, and Physician Distribution and Medical Licensure in the U.S., Chicago, Center for Health Services Research and Development, American Medical Association. Population Data from U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 793, "Estimates of the Population of the United States to January 1, 1979," U.S. Government Printing Office, Washington, D.C.

Table III—Distribution by Age of Physician of the Population and Respondents to the Thirteenth Periodic Survey of Physicians

	Population		Respondents	
Age	No.	%	No.	%
Unknown	392	0.2%	0	0.0%
Under 35	20,032	8.7	286	6.4
35-49	98,707	42.8	1,845	41.0
50-64	79,245	34.4	1,652	36.7
65 and over	32,037	13.9	716	15.9
Total	230,413	100.0	4,499	100.0

Table IV—Distribution by Sex of Physician of the Population and Respondents to the Thirteenth Periodic Survey of Physicians

	Population		Respondents	
Sex	No.	%	No.	%
Male	216,036	93.8%	4,252	94.5%
Female	14,377	6.2	247	5.5
Total	230,413	100.0	4,499	100.0

TABLE FORMAT

Summary statistics from data collected are presented in tables that largely correspond to PSP statistics presented in previous editions of this book. Over the years, some PSP questions concerning physicians' work patterns, fees, expenses, and net incomes have changed; however, steps taken during the analyses of these data attempt to assure continuity and comparability of the data over time. New tables include previously unreported data on the proportion of physicians incorporated and on income differences between incorporated and not incorporated physicians.

The five characteristics employed to present the data, as in recent years, are specialty group, census division of practice, location (size of county of practice), type of practice (number of physicians in practice), and age of physician.

Nine specialty groups are obtained from the thirty-six specialties employed in the AMA's Physician Distribution and Medical Licensure series. The correspondence of the thirty-six specialties and the nine groups are:

1) General Practice (General and Family Practice);
2) Internal Medicine (Internal Medicine, Allergy, Cardiovascular Disease, Gastroenterology, and Pulmonary Disease);
3) Surgery (General Surgery, Neurological Surgery, Ophthalmology, Orthopedic Surgery, Otolaryngology, Plastic Surgery, Colon and Rectal Surgery, Thoracic Surgery, and Urology);
4) Pediatrics (Pediatrics, Pediatric Allergy, and Pediatric Cardiology);
5) Obstetrics and Gynecology;
6) Radiology (Radiology, Diagnostic Radiology, and Therapeutic Radiology);
7) Psychiatry (Psychiatry and Child Psychiatry); and
8) Anesthesiology.

The ninth specialty group, "Other," consisting of the specialties of Dermatology, Neurology, Occupational Medicine, Pathology, Physical Medicine, Public Health, and General Preventive Medicine, as well as physicians practicing in other or unspecified specialties, is included in the totals only.

In the tables, the fifty states are grouped into the nine census divisions used by the Department of Commerce. The nine divisions and the states they consist of are as follows:

1) New England (Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island);
2) Middle Atlantic (New York, Pennsylvania, New Jersey);
3) East North Central (Ohio, Indiana, Illinois, Michigan, Wisconsin);
4) West North Central (Minnesota, Iowa, Missouri, Kansas, Nebraska, South Dakota, North Dakota);
5) South Atlantic (Delaware, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, Georgia, Florida);
6) East South Central (Kentucky, Tennessee, Alabama, Mississippi);
7) West South Central (Louisiana, Arkansas, Oklahoma, Texas);
8) Mountain (Montana, Idaho, Wyoming, Nevada, Utah, Colorado, New Mexico, Arizona); and
9) Pacific (California, Oregon, Washington, Hawaii, Alaska).

Figure A is a United States map that outlines the nine census divisions described above.

Location describes the setting of the practice within three categories: nonmetropolitan areas, metropolitan areas with less than one million persons, and metropolitan areas with more than one million persons.

The type of practice is divided into seven size categories:

- Solo
- 2 MD
- 3 MD
- 4 MD
- 5-7 MD
- 8-25 MD
- 26 MD and Over

Finally, the age of the physician is presented in six groups:

- 35 Years and Under
- 36-40 Years
- 41-45 Years
- 46-50 Years
- 51-60 Years
- 61 Years and Over

Readers familiar with previous editions of Profile of Medical Practice may notice that a significant number of tables have been deleted from this year's volume. Earlier editions presented many more "two-way breakdowns." For example, income, fee, expense, and work pattern data were broken down by specialty and some other physician characteristic such as age, type of practice, or practice location. Differences in mean values among the individual cells of these tables, however, generally were not significant because partitioning the data by another physician characteristic tended to increase the standard errors of these means. In short, where the two-way breakdowns failed to provide any additional reliable information, these tables have been deleted.

STANDARDS OF RELIABILITY

Estimates derived from the data are not presented unless they conform to the following reliability standards:

- Each estimate must be based on more than five observations; and
- the estimate must be at least twice its standard error.

Physicians' Work Patterns

The average office-based physician worked 47.4 weeks in 1978.

- Pediatricians worked the most number of weeks in 1978 (48.2 weeks) and anesthesiologists worked the fewest number of weeks in 1978 (45.8 weeks).
- Only radiologists and anesthesiologists worked fewer weeks in 1978 than in 1977. Surgeons worked the same number of weeks in 1978 as in 1977. All other specialty groups reported working more weeks in 1978 than in 1977.
- Physicians in the New England census division worked the fewest number of weeks (46.8 weeks) in 1978, and physicians in the West South Central census division worked the most number of weeks (48.0 weeks) in 1978.

The average office-based physician worked 49.7 hours per week in 1979 as compared with 50.3 hours in 1978 and 52.2 hours in 1977.

- Surgeons worked the longest week in 1979 (52.7 hours) and psychiatrists worked the shortest week in 1979 (45.6 hours).
- In 1979, physicians in the East South Central census division worked the longest week (51.8 hours), and physicians in the Pacific census division worked the shortest week (48.3 hours).
- The average physician in a metropolitan area with a population of at least one million persons worked a shorter week (48.3 hours) than either the average physician in a metropolitan area of less than one million persons (50.9 hours) or a physician in a non-metropolitan area (51.6 hours).
- Of the average 49.7-hour work week, the typical physician reported working 27.1 hours per week in the office in 1979 and 16.8 hours per week in the hospital in 1979.

The typical physician had 122.7 patient visits per week in 1979, less than the average of 130.6 patient visits in 1978 and the average of 128.5 patient visits in 1976.

- The average radiologist had the most total patient visits per week (193.0 visits), followed by general practitioners (157.7 visits).
- The average physician in the East South Central census division had the most patient visits per week (158.5 visits) and the average physician in the New England census division had the fewest patient visits per week (97.8 visits).

- In 1979, the average physician in a metropolitan area of at least one million persons had 108.7 patient visits per week which was less than 126.9 patient visits per week for the physician in a metropolitan area of less than one million persons and 153.3 patient visits per week for a physician in a nonmetropolitan area.
- The average physician reported 84.3 patient visits per week in the office and 36.2 patient visits per week in the hospital in 1979.

The patient's average waiting time in the physician's office was 20.9 minutes in 1979. Also in 1979, new patients had to wait 9.2 days on average for an appointment for a routine visit and 3.9 days for an appointment for a specific complaint. Established patients had to wait, on average, 5.8 days for an appointment for a routine visit and 1.9 days for an appointment for a specific complaint.

Figure A—The United States Divided into Nine Census Divisions

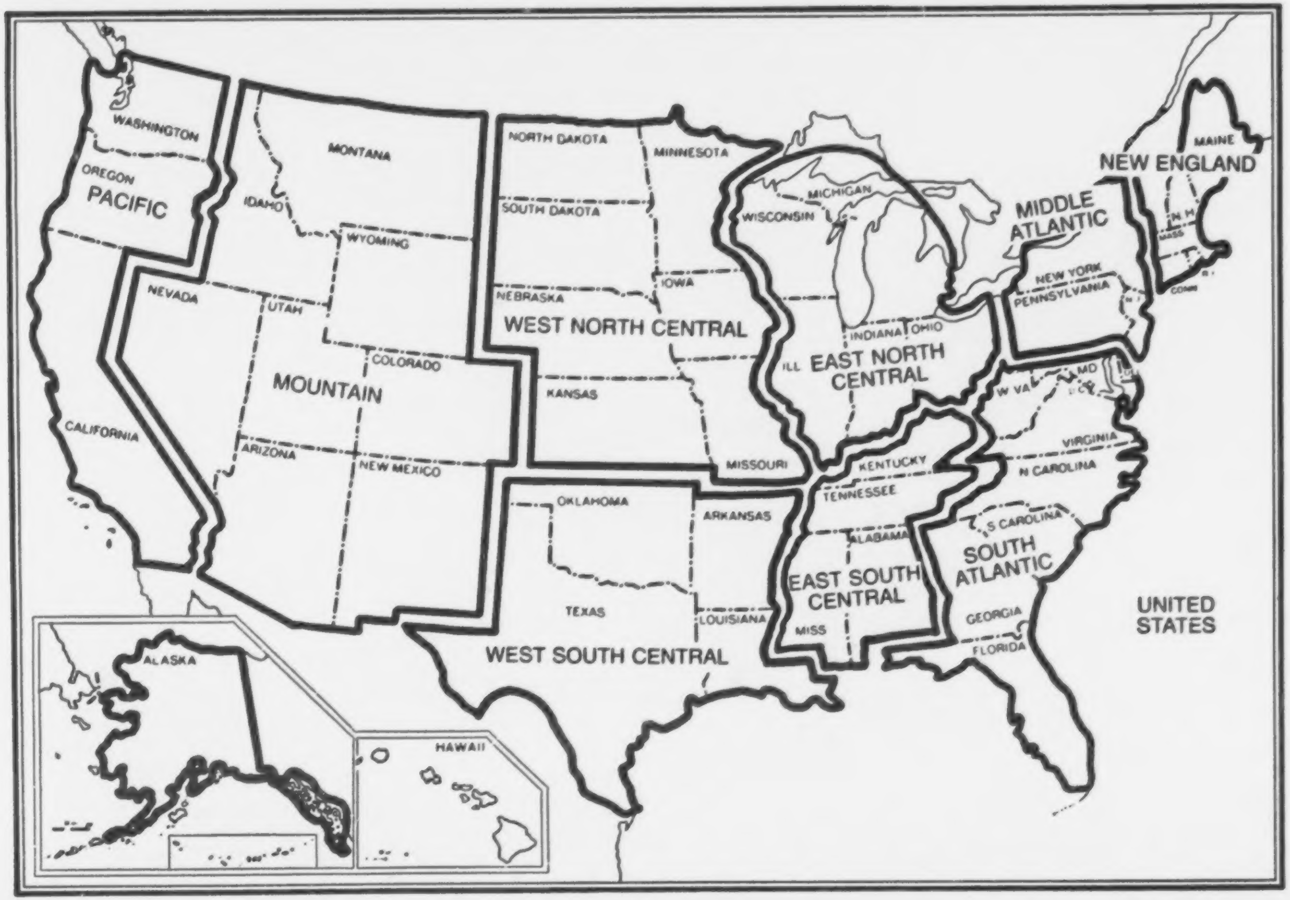

WASHINGTON
OREGON
PACIFIC
CALIFORNIA
MONTANA
IDAHO
WYOMING
NEVADA
UTAH
COLORADO
MOUNTAIN
ARIZONA
NEW MEXICO
NORTH DAKOTA
MINNESOTA
SOUTH DAKOTA
NEBRASKA
IOWA
WEST NORTH CENTRAL
KANSAS
MISSOURI
WISCONSIN
MICHIGAN
ILL
INDIANA
OHIO
EAST NORTH CENTRAL
MAINE
NEW ENGLAND
N H
MASS
CONN
MIDDLE ATLANTIC
NEW YORK
PENNSYLVANIA
W VA
MD
VIRGINIA
N CAROLINA
S CAROLINA
SOUTH ATLANTIC
GEORGIA
FLORIDA
KENTUCKY
TENNESSEE
ALABAMA
EAST SOUTH CENTRAL
MISS
OKLAHOMA
ARKANSAS
TEXAS
LOUISIANA
WEST SOUTH CENTRAL
ALASKA
HAWAII
UNITED STATES

Table 13—Average Number of Weeks Practiced per Year by Specialty, 1970, 1972-1975, 1977, 1978

	Year						
Specialty	1970 (N = 4226)	1972 (N = 4439)	1973 (N = 4878)	1974 (N = 5211)	1975 (N = 5261)	1977 (N = 4373)	1978 (N = 4387)
Total[a]	47.5	47.2	47.2	47.2	47.2	47.0	47.4
General Practice	48.1	47.7	47.4	47.4	47.4	47.2	47.8
Internal Medicine	47.2	47.2	47.1	47.3	47.2	47.1	47.2
Surgery	47.4	46.8	46.9	47.2	46.9	47.0	47.0
Pediatrics	48.1	47.4	47.5	47.6	47.3	47.2	48.2
Obstetrics-Gynecology	48.0	47.5	47.7	47.4	47.3	47.4	47.9
Radiology	49.0	47.1	47.1	46.7	47.4	47.2	46.8
Psychiatry	46.2	47.4	47.4	47.4	47.4	46.9	47.7
Anesthesiology	46.1	46.2	46.9	46.5	46.2	45.9	45.8

[a] Physicians whose specialties were classified as "Other" or "Not Specified" are included in this total.

Source: Periodic Survey of Physicians, 1971-1979. Center for Health Services Research and Development, American Medical Association.

Table 14—Average Number of Weeks Practiced per Year by Census Division and Specialty, 1978

Census Division	Total		Specialty							
	N	Mean	Gen.Prac. (N=864)	Int.Med. (N=796)	Surg. (N=998)	Ped. (N=288)	Ob./Gyn. (N=325)	Rad. (N=210)	Psych. (N=323)	Anes. (N=161)
			Mean							
Total[a]	4,387	47.4	47.8	47.2	47.0	48.2	47.9	46.8	47.7	45.8
New England	270	46.8	44.3	46.6	47.0	47.9	47.4	47.2	47.4	45.1
Mid. Atlantic	775	47.3	47.5	46.9	46.8	47.7	49.2	47.4	47.5	48.1
E. N. Central	706	47.1	47.4	46.6	47.0	48.3	47.4	46.5	47.2	46.7
W. N. Central	314	47.4	47.4	47.9	46.6	46.8	47.7	47.6	48.1	46.4
South Atlantic	702	47.8	48.7	47.2	47.5	48.6	48.1	46.3	47.7	46.4
E. S. Central	219	47.9	49.0	47.7	47.7	49.0	47.0	48.0	b	43.3
W. S. Central	347	48.0	48.6	48.9	46.9	49.4	47.8	49.4	47.1	47.9
Mountain	247	47.3	47.8	47.4	47.4	45.5	48.9	47.0	49.1	41.2
Pacific	807	47.2	47.4	47.4	46.9	48.6	47.1	44.9	48.3	45.1
		Standard Error of the Mean								
Total		.075	.162	.190	.160	.222	.268	.412	.231	.437
New England		.306	1.575	.818	.524	.459	.525	.758	.568	2.819
Mid. Atlantic		.153	.323	.352	.338	.484	.328	.790	.467	.710
E. N. Central		.189	.385	.542	.425	.385	.515	.882	.788	.571
W. N. Central		.284	.680	.527	.712	1.707	.827	.840	.727	.959
South Atlantic		.197	.354	.570	.433	.503	.662	1.372	.601	1.554
E. S. Central		.365	.379	.814	.635	.619	2.386	1.656	b	3.105
W. S. Central		.280	.499	.570	.712	.343	.863	.387	1.461	.537
Mountain		.336	.619	.869	.643	2.735	.361	1.130	.559	2.616
Pacific		.174	.404	.452	.339	.307	.884	1.322	.262	.797

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 15—Average Number of Hours Practiced per Week by Specialty, 1970, 1971, 1973-1976, 1978, 1979

Specialty	Year 1970 (N=4258)	1971 (N=4064)	1973 (N=4263)	1974 (N=4875)	1975 (N=5253)	1976 (N=5286)	1978 (N=4381)	1979 (N=4445)
Total[a]	51.4	53.6	50.8	49.9	51.8	52.2	50.3	49.7
General Practice	52.1	54.1	51.1	49.7	52.2	51.4	49.5	48.2
Internal Medicine	51.6	55.2	52.7	51.7	53.6	55.7	52.8	51.8
Surgery	53.2	54.6	52.4	51.9	53.7	54.4	53.2	52.7
Pediatrics	51.7	54.2	49.3	48.4	50.0	49.8	48.8	48.3
Obstetrics-Gynecology	55.1	59.1	52.3	52.9	54.9	54.3	51.1	52.2
Radiology	47.4	48.7	47.3	47.6	45.9	48.4	47.8	47.7
Psychiatry	47.1	45.1	46.7	44.1	46.7	48.1	45.4	45.6
Anesthesiology	53.2	54.4	52.1	48.9	50.7	51.1	50.3	48.8

[a] Physicians whose specialties were classified as "Other" or "Not Specified" are included in this total.

Source: Periodic Survey of Physicians, 1970-1979. Center for Health Services Research and Development, American Medical Association.

Table 16—Average Number of Hours Practiced per Week by Census Division and Specialty, 1979

	Total		Specialty							
Census Division	N	Mean	Gen.Prac. (N=884)	Int.Med. (N=795)	Surg. (N=1008)	Ped. (N=290)	Ob./Gyn. (N=328)	Rad. (N=209)	Psych. (N=329)	Anes. (N=164)
			Mean							
Total[a]	4,445	49.7	48.2	51.8	52.7	48.3	52.2	47.7	45.6	48.8
New England	270	49.1	45.0	49.6	53.7	50.4	52.5	47.1	44.1	46.8
Mid Atlantic	788	48.7	46.1	49.5	52.3	47.2	54.8	50.5	45.2	48.8
E. N. Central	713	48.9	46.8	50.2	53.6	45.6	49.0	46.9	45.3	54.5
W. N. Central	318	51.5	51.3	53.1	53.7	52.2	54.1	46.2	48.0	47.0
South Atlantic	711	51.0	49.1	54.2	53.8	49.5	51.4	47.3	49.3	49.3
E. S. Central	219	51.8	52.6	55.6	49.9	51.3	55.3	48.6	b	49.4
W. S. Central	353	51.0	53.9	55.3	48.9	49.8	51.3	47.1	45.0	46.4
Mountain	250	51.1	46.8	55.4	58.0	46.8	54.6	43.9	46.6	46.2
Pacific	823	48.3	46.1	51.2	51.1	46.5	51.6	47.7	42.1	47.1
		Standard Error of the Mean								
Total		.219	.510	.525	.479	.752	.880	.680	.686	1.002
New England		.808	2.654	2.036	1.651	2.497	3.389	1.388	2.032	3.421
Mid Atlantic		.577	1.445	1.224	1.203	2.020	2.301	1.419	1.678	3.445
E. N. Central		.557	1.219	1.382	1.264	2.330	2.258	1.461	1.716	2.306
W. N. Central		.839	1.728	1.761	2.401	2.758	4.637	1.932	3.444	2.943
South Atlantic		.559	1.408	1.308	1.153	1.868	2.185	2.153	1.668	3.214
E. S. Central		.886	1.569	2.102	2.046	2.568	4.295	1.841	b	4.851
W. S. Central		.723	1.511	2.066	1.698	1.900	2.149	3.795	2.510	3.208
Mountain		.865	1.734	2.106	1.755	2.789	2.346	4.148	2.289	3.688
Pacific		.473	1.054	1.154	.980	1.638	2.160	1.569	1.287	1.977

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 17—Average Number of Hours Practiced per Week by Specialty and Location, 1979

			Location		
			Nonmetropolitan	Metropolitan	
	Total			Less than 1,000,000[b]	1,000,000 and over[c]
Specialty	N	Mean	(N = 728)	(N = 1545)	(N = 2172)
				Mean	
Total[a]	4,445	49.7	51.6	50.9	48.3
General Practice	884	48.2	50.8	50.3	44.4
Internal Medicine	795	51.8	54.3	53.8	50.0
Surgery	1,008	52.7	54.9	52.5	52.0
Pediatrics	290	48.3	49.7	51.1	46.1
Obstetrics-Gynecology	329	52.2	56.4	52.1	51.4
Radiology	209	47.7	46.7	48.5	47.2
Psychiatry	329	45.6	45.5	44.5	46.0
Anesthesiology	164	48.8	42.8	49.7	49.6
				Standard Error of the Mean	
Total		.219	.549	.368	.311
General Practice		.510	.918	.877	.812
Internal Medicine		.525	1.388	.960	.689
Surgery		.479	1.212	.769	.707
Pediatrics		.752	2.037	1.196	1.061
Obstetrics-Gynecology		.880	2.609	1.393	1.250
Radiology		.680	2.482	1.022	.921
Psychiatry		.686	2.318	1.408	.827
Anesthesiology		1.002	2.626	1.532	1.464

[a] Total includes "Other" category. [b] Includes all counties in SMSAs with 50,000 to 999,999 inhabitants and all counties considered potential SMSAs. [c] Includes all counties in SMSAs with 1,000,000 or more inhabitants.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 18—Average Number of Hours of Direct Patient Care per Week by Specialty, 1970, 1971, 1973-1976, 1978, 1979

	Year							
Specialty	1970 (N=4374)	1971 (N=3478)	1973 (N=4215)	1974 (N=4796)	1975 (N=5246)	1976 (N=5203)	1978 (N=4324)	1979 (N=4272)
Total[a]	44.7	46.3	46.1	44.5	47.5	46.5	45.4	44.9
General Practice	47.7	49.6	47.6	45.5	49.0	46.5	45.8	45.0
Internal Medicine	45.5	49.7	47.5	46.2	49.2	49.3	47.8	47.2
Surgery	47.2	44.3	47.8	46.3	48.9	47.9	48.2	46.9
Pediatrics	45.9	48.5	44.5	44.2	46.1	44.9	44.5	43.5
Obstetrics-Gynecology	49.9	46.6	48.8	48.1	51.6	49.4	47.3	47.8
Radiology	34.5	40.1	41.8	41.4	41.9	44.5	43.9	43.7
Psychiatry	37.3	38.6	40.3	37.3	41.0	41.3	38.2	39.6
Anesthesiology	46.8	43.9	48.0	44.7	47.2	47.2	46.6	44.5

[a] Physicians whose specialties were classified as "Other" or "Not Specified" are included in this total.

Source: Periodic Survey of Physicians, 1970-1979. Center for Health Services Research and Development, American Medical Association.

Table 19—Average Number of Hours of Direct Patient Care per Week by Census Division and Specialty, 1979

Census Division	Total N	Total Mean	Gen.Prac. (N=840)	Int.Med. (N=768)	Surg. (N=965)	Ped. (N=276)	Ob./Gyn. (N=317)	Rad. (N=203)	Psych. (N=322)	Anes. (N=150)
			Specialty							
			Mean							
Total[a]	4,272	44.9	45.0	47.2	46.9	43.5	47.8	43.7	39.6	44.5
New England	262	43.4	41.6	45.6	45.9	43.0	49.8	41.6	38.4	36.1
Mid Atlantic	757	43.9	42.2	45.2	46.8	41.6	48.0	46.0	40.0	46.2
E. N. Central	685	43.9	43.5	45.3	48.5	39.9	44.2	42.1	39.3	49.1
W. N. Central	303	46.8	48.4	49.6	48.6	46.6	52.5	43.7	40.3	43.1
South Atlantic	681	46.4	44.3	49.8	48.8	46.2	48.6	42.5	44.2	44.3
E. S. Central	208	47.6	48.9	51.2	45.1	45.8	51.5	47.5	b	42.8
W. S. Central	340	46.4	51.3	50.3	43.7	45.2	48.4	43.3	38.3	45.6
Mountain	244	46.8	44.7	49.2	51.8	45.8	50.3	39.4	40.2	45.8
Pacific	792	43.3	43.9	46.4	44.1	42.1	46.0	45.0	35.2	41.9
		Standard Error of the Mean								
Total		.223	.510	.526	.483	.763	.905	.742	.721	1.068
New England		.608	2.946	2.076	1.716	1.955	3.261	1.600	1.690	4.882
Mid Atlantic		.567	1.451	1.180	1.237	2.080	2.169	1.456	1.588	3.954
E. N. Central		.561	1.170	1.339	1.328	1.936	2.446	1.367	1.588	2.688
W. N. Central		.843	1.773	1.756	2.095	2.627	4.880	2.250	3.609	3.087
South Atlantic		.591	1.450	1.342	1.172	1.828	2.389	2.414	1.956	3.280
E. S. Central		.899	1.350	2.379	2.060	2.518	3.927	1.988	b	4.169
W. S. Central		.780	1.672	2.109	1.696	2.550	1.966	3.952	2.933	2.705
Mountain		.920	1.756	2.497	1.903	5.054	2.130	5.573	2.736	3.736
Pacific		.475	1.001	1.148	.969	1.770	2.294	1.688	1.517	2.105

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 20—Average Number of Hours of Direct Patient Care per Week by Specialty and Location, 1979

			Location		
			Nonmetropolitan	Metropolitan	
	Total			Less than 1,000,000[b]	1,000,000 and over[c]
Specialty	N	Mean	(N = 697)	(N = 1460)	(N = 2091)
			Mean		
Total[a]	4,272	44.9	47.7	45.9	43.2
General Practice	840	45.0	48.3	46.5	41.0
Internal Medicine	768	47.2	49.8	48.9	45.5
Surgery	965	46.9	50.2	46.8	45.9
Pediatrics	276	43.5	47.0	46.4	40.6
Obstetrics-Gynecology	317	47.8	52.5	47.7	46.9
Radiology	203	43.7	42.5	44.9	43.2
Psychiatry	322	39.6	41.5	38.2	40.1
Anesthesiology	156	44.5	40.2	46.4	44.1
		Standard Error of the Mean			
Total		.223	.557	.375	.316
General Practice		.510	.871	.875	.843
Internal Medicine		.526	1.483	.968	.678
Surgery		.483	1.146	.779	.723
Pediatrics		.763	2.028	1.363	.975
Obstetrics-Gynecology		.905	3.029	1.326	1.302
Radiology		.742	2.258	1.156	1.057
Psychiatry		.721	2.501	1.613	.822
Anesthesiology		1.068	2.684	1.487	1.654

[a] Total includes "Other" category. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 21—Average Number of Office Hours per Week by Specialty and Location, 1979

Specialty	Total		Location		
			Nonmetropolitan	Metropolitan	
	N	Mean	(N = 695)	Less than 1,000,000[b] (N = 1452)	1,000,000 and over[c] (N = 2040)
			Mean		
Total[a]	4,187	27.1	29.2	26.7	26.8
General Practice	877	33.6	34.8	34.0	32.1
Internal Medicine	787	28.1	31.5	27.8	27.6
Surgery	994	22.7	23.6	22.6	22.4
Pediatrics	280	34.9	38.5	35.3	33.8
Obstetrics-Gynecology	320	29.3	29.0	29.7	29.1
Radiology	135	16.6	9.9	16.9	18.5
Psychiatry	322	31.1	32.6	28.5	32.1
		Standard Error of the Mean			
Total		.210	.503	.352	.306
General Practice		.377	.630	.669	.643
Internal Medicine		.396	.968	.704	.540
Surgery		.375	.890	.587	.577
Pediatrics		.674	1.547	1.158	.938
Obstetrics-Gynecology		.531	1.600	.753	.801
Radiology		1.568	3.439	2.506	2.383
Psychiatry		.711	1.508	1.206	.932

[a] Total includes Anesthesiology and "Other" categories. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 22—Average Number of Hospital Hours per Week by Specialty and Location, 1979

	Total		Location		
			Nonmetropolitan	Metropolitan	
Specialty	N	Mean	(N = 687)	Less than 1,000,000[b] (N = 1460)	1,000,000 and over[c] (N = 2000)
				Mean	
Total[a]	4,147	16.8	17.6	17.9	15.7
General Practice	841	11.2	12.7	11.8	9.4
Internal Medicine	774	18.3	18.5	19.6	17.4
Surgery	980	20.5	23.3	20.7	19.2
Pediatrics	277	9.6	10.7	11.1	8.3
Obstetrics-Gynecology	315	16.5	19.8	15.8	16.4
Radiology	166	27.2	30.4	29.5	24.1
Psychiatry	276	9.8	11.0	10.9	9.2
Anesthesiology	151	33.3	28.5	36.5	32.2
				Standard Error of the Mean	
Total		.238	.544	.416	.339
General Practice		.340	.590	.608	.556
Internal Medicine		.478	1.176	.866	.644
Surgery		.505	1.117	.839	.751
Pediatrics		.580	1.762	1.071	.727
Obstetrics-Gynecology		.650	2.049	1.011	.919
Radiology		1.597	3.821	2.601	2.364
Psychiatry		.667	3.087	1.204	.831
Anesthesiology		1.664	4.691	2.628	2.396

[a] Total includes "Other" category. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 23—Average Number of Total Patient Visits per Week by Specialty, 1970, 1971, 1973-1976, 1978, 1979

	Year							
Specialty	1970 (N=4342)	1971 (N=3860)	1973 (N=3026)	1974 (N=4479)	1975 (N=5151)	1976 (N=4551)	1978 (N=1824)	1979 (N=3755)
Total[a]	132.5	135.8	137.7	125.8	126.5	128.5	130.6	122.7
General Practice	172.9	171.5	189.9	174.4	177.2	167.8	180.0	157.7
Internal Medicine	122.6	127.2	127.2	126.3	124.7	124.3	118.6	117.5
Surgery	122.2	123.4	129.5	119.6	119.6	122.2	110.8	115.9
Pediatrics	145.2	163.4	158.1	152.5	140.2	146.1	148.1	138.9
Obstetrics-Gynecology	132.8	125.6	132.4	130.7	131.8	133.2	126.2	126.0
Radiology	233.9	199.6	166.8	134.9	138.4	207.1	209.6	193.0
Psychiatry	54.6	46.5	52.2	46.7	48.3	50.6	54.4	57.2
Anesthesiology	48.4	57.8	42.6	32.0	33.0	33.8	43.2	31.0

[a] Physicians whose specialties were classified as "Other" or "Not Specified" are included in this total.

Source: Periodic Survey of Physicians, 1970-1979. Center for Health Services Research and Development, American Medical Association.

Table 24—Average Number of Total Patient Visits per Week by Census Division and Specialty, 1979

	Total		Specialty							
Census Division	N	Mean	Gen.Prac. (N=800)	Int.Med. (N=747)	Surg. (N=942)	Ped. (N=253)	Ob./Gyn. (N=310)	Rad. (N=75)	Psych. (N=258)	Anes. (N=85)
			Mean							
Total[a]	3,755	122.7	157.7	117.5	115.9	138.9	126.0	193.0	57.2	31.0
New England	223	97.8	110.4	104.7	92.9	140.0	121.1	b	52.6	b
Mid Atlantic	638	118.1	131.5	113.0	120.7	139.1	127.7	235.4	51.5	18.2
E. N. Central	613	132.8	158.6	134.7	128.9	147.2	131.4	202.7	63.1	46.8
W. N. Central	265	135.9	169.5	125.8	130.3	126.9	169.2	b	65.3	33.3
South Atlantic	600	125.6	167.2	124.1	117.8	135.2	115.7	215.6	59.1	32.1
E. S. Central	185	158.5	218.2	139.5	149.8	175.6	135.1	b	b	b
W. S. Central	313	129.3	194.3	110.2	103.8	167.0	131.1	152.0	72.6	35.0
Mountain	213	122.8	152.0	113.0	126.1	123.9	153.9	b	56.7	21.8
Pacific	705	106.1	135.9	102.6	96.1	117.9	107.3	202.2	45.8	24.5
		Standard Error of the Mean								
Total		1.334	3.016	2.502	2.291	3.904	3.431	21.330	2.638	2.869
New England		3.740	10.953	6.615	5.514	15.497	10.435	b	9.024	b
Mid Atlantic		3.235	6.692	5.070	6.119	9.351	11.325	60.914	4.545	3.616
E. N. Central		3.579	6.691	7.478	6.304	10.821	7.921	81.683	8.420	11.709
W. N. Central		6.064	11.413	8.225	14.567	18.032	19.884	b	14.111	8.837
South Atlantic		3.336	9.014	6,509	4.920	8.910	7.110	47.722	5.867	4.965
E. S. Central		7.015	16.630	11.837	12.707	17.094	13.349	b	b	b
W. S. Central		4.737	10.660	9.515	6.658	14.267	9.663	47.563	11.519	7.715
Mountain		5.159	9.604	15.031	8.999	20.717	13.493	b	12.525	2.798
Pacific		2.460	4.507	5.374	3.224	6.305	6.072	31.656	3.225	2.854

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 25—Average Number of Total Patient Visits per Week by Specialty and Location, 1979

			Location		
			Nonmetropolitan	Metropolitan	
	Total			Less than 1,000,000[b]	1,000,000 and over[c]
Specialty	N	Mean	(N = 637)	(N = 1322)	(N = 1796)
			Mean		
Total[a]	3,755	122.7	153.3	126.9	108.7
General Practice	800	157.7	181.9	159.7	134.6
Internal Medicine	747	117.5	154.0	126.4	103.9
Surgery	942	115.9	137.2	117.0	107.4
Pediatrics	253	138.9	146.8	157.9	122.4
Obstetrics-Gynecology	310	126.0	139.2	129.7	120.7
Radiology	75	193.0	159.4	187.6	205.1
Psychiatry	258	57.2	106.6	57.5	52.6
Anesthesiology	85	31.0	30.3	34.5	28.7
			Standard Error of the Mean		
Total		1.334	3.581	2.149	1.836
General Practice		3.016	5.949	4.962	4.393
Internal Medicine		2.502	7.930	4.816	2.835
Surgery		2.291	6.358	3.450	3.373
Pediatrics		3.904	12.836	6.873	4.485
Obstetrics-Gynecology		3.431	10.170	5.067	5.011
Radiology		21.330	56.677	28.868	33.634
Psychiatry		2.638	24.064	4.744	2.465
Anesthesiology		2.869	7.464	3.757	4.598

[a] Total includes "Other" category. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 26—Average Number of Office Visits per Week by Specialty and Location, 1979

			Location		
			Nonmetropolitan	Metropolitan	
	Total			Less than 1,000,000[b]	1,000,000 and over[c]
Specialty	N	Mean	(N = 668)	(N = 1392)	(N = 1972)
				Mean	
Total[a]	4,032	84.3	106.2	86.8	75.0
General Practice	854	119.9	134.7	123.9	104.6
Internal Medicine	774	69.3	96.8	70.6	62.4
Surgery	980	75.2	85.1	77.5	69.7
Pediatrics	269	116.4	121.6	129.7	105.0
Obstetrics-Gynecology	319	100.2	106.1	101.5	98.1
Radiology	100	88.2	90.5	80.6	92.5
Psychiatry	318	38.2	58.5	36.4	37.2
				Standard Error of the Mean	
Total		1.039	2.615	1.740	1.448
General Practice		2.302	3.973	4.570	3.339
Internal Medicine		1.735	4.947	2.974	2.263
Surgery		1.730	4.530	2.687	2.576
Pediatrics		3.475	9.697	6.496	4.121
Obstetrics-Gynecology		3.804	8.544	3.914	6.397
Radiology		9.999	45.191	13.580	13.672
Psychiatry		1.677	14.925	3.190	1.647

[a] Total includes Anesthesiology and "Other" categories. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 27—Average Number of Hospital Visits per Week by Specialty and Location, 1979

Specialty	Total N	Total Mean	Location: Nonmetropolitan (N = 664)	Location: Metropolitan, Less than 1,000,000[b] (N = 1383)	Location: Metropolitan, 1,000,000 and over[c] (N = 1873)
			Mean		
Total[a]	3,920	36.2	43.7	38.6	31.7
General Practice	813	29.0	38.1	29.1	21.0
Internal Medicine	757	43.3	50.9	48.6	38.4
Surgery	949	36.6	46.1	35.5	34.1
Pediatrics	262	19.4	19.9	24.9	15.3
Obstetrics-Gynecology	312	26.4	34.1	25.9	25.0
Radiology	108	142.1	176.2	147.2	125.8
Psychiatry	263	15.6	22.4	20.7	12.5
Anesthesiology	130	30.9	32.7	31.6	30.0
		Standard Error of the Mean			
Total		.850	2.314	1.479	1.132
General Practice		1.177	2.591	1.779	1.572
Internal Medicine		1.363	3.747	2.546	1.737
Surgery		1.378	4.061	2.069	2.003
Pediatrics		1.841	2.171	3.633	2.375
Obstetrics-Gynecology		1.412	4.187	1.730	2.205
Radiology		17.104	57.784	26.564	22.808
Psychiatry		1.519	5.878	3.489	1.571
Anesthesiology		2.251	5.746	2.515	3.712

[a] Total includes "Other" category. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 28—Average Waiting Time for Appointment and in Office by Specialty, 1979

	Waiting Time				
	In Office (in minutes)	For Appointment (in days)			
		Routine Visit		Specific Complaint	
		New Patient	Established Patient	New Patient	Established Patient
Specialty	(N=3869)	(N=3855)	(N=3830)	(N=3670)	(N=3682)
	Mean				
Total[a]	20.9	9.2	5.8	3.9	1.9
General Practice	24.6	4.5	2.7	2.0	1.0
Internal Medicine	20.8	12.2	5.4	6.4	1.9
Surgery	22.3	10.5	7.7	3.9	2.8
Pediatrics	22.3	10.3	8.6	1.6	1.1
Obstetrics-Gynecology	24.4	14.4	13.1	5.0	2.4
Radiology	17.1	1.8	1.5	1.0	0.8
Psychiatry	6.7	8.2	3.6	5.1	2.4
Anesthesiology	9.3	2.0	1.0	1.3	b
	Standard Error of the Mean				
Total	.256	.311	.256	.153	.065
General Practice	.603	.366	.215	.256	.071
Internal Medicine	.540	.698	.382	.492	.196
Surgery	.491	.728	.626	.204	.151
Pediatrics	.918	.892	.971	.172	.169
Obstetrics-Gynecology	.955	1.344	1.897	.824	.217
Radiology	1.004	.635	.584	.125	.108
Psychiatry	.565	1.215	.304	.470	.198
Anesthesiology	2.231	.864	.419	.604	b

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 29—Average Waiting Time for Appointment and in Office by Location, 1979

	Waiting Time				
	In Office (in minutes)	For Appointment (in days)			
		Routine Visit		Specific Complaint	
		New Patient	Established Patient	New Patient	Established Patient
Location	(N=3869)	(N=3855)	(N=3830)	(N=3670)	(N=3682)
	Mean				
Total	20.9	9.2	5.8	3.9	1.9
Nonmetropolitan	23.7	9.2	5.8	3.3	1.6
Metropolitan:					
Less than 1,000,000[a]	21.7	11.1	6.9	4.9	2.1
1,000,000 and over[b]	19.3	7.8	5.1	3.4	1.9
	Standard Error of the Mean				
Total	.256	.311	.256	.153	.065
Nonmetropolitan	.617	.927	.735	.303	.190
Metropolitan:					
Less than 1,000,000	.474	.620	.552	.356	.122
1,000,000 and over	.340	.335	.243	.156	.079

[a] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs.

[b] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Physicians' Fees

For all six specialties reported, fees for an initial office visit rose in 1979 from 1978 levels by the following percentages:

- Internal Medicine—17.4%
- Pediatrics—10.7%
- General Practice—10.0%
- Surgery—9.5%
- Psychiatry—4.0%
- Obstetrics-Gynecology—2.8%

The location of the practice appears to be related to physicians' average fees. Physicians in nonmetropolitan areas had the lowest average fee for an initial office visit ($21.35). Physicians in metropolitan areas with more than one million persons had the highest average fee for an initial office visit ($35.17). Furthermore, this relationship of fees exists for average follow-up office visits and for follow-up hospital visits.

The following points are of interest concerning physicians' average fees when examined by census division in 1979:

- The average initial office visit fee was highest in the Pacific census division ($35.33) and lowest in the West North Central census division ($22.73).
- The average fee for a follow-up office visit was highest in the Pacific census division ($22.15) and lowest in the West North Central census division ($14.64).
- The average fee for a follow-up hospital visit was highest in the Middle Atlantic census division ($29.02) and lowest in the West North Central census division ($19.33).
- The average fee for an appendectomy was highest in the Pacific census division ($502.76) and lowest in the East South Central census division ($297.54).

Table 30—Average Fee for Initial Office Visit by Specialty, 1970, 1971, 1973-1976, 1978, 1979[a]

Specialty	Year							
	1970	1971	1973	1974	1975	1976	1978	1979
General Practice	$ 8.46	$ 9.65	$10.74	$12.03	$13.11	$14.80	$16.55	$18.21
Internal Medicine	17.81	20.38	20.51	23.11	26.11	31.27	32.53	38.18
Surgery	14.72	16.43	17.69	18.87	20.81	23.29	26.52	29.04
Pediatrics	9.95	11.18	12.20	14.49	16.18	17.45	19.03	21.06
Obstetrics-Gynecology	14.23	17.59	19.68	22.07	23.57	27.41	29.85	30.70
Psychiatry	32.64	35.58	37.51	41.39	44.61	50.15	54.63	56.80

[a] An initial office visit is defined as "office visit, new patient, brief evaluation, history, examination and/or treatment."

Source: Periodic Survey of Physicians, 1970-1979. Center for Health Services Research and Development, American Medical Association.

Table 31—Average Fee for Initial Office Visit by Census Division and Specialty, 1979

Census Division	Total		Specialty					
	N	Mean	General Practice (N=765)	Internal Medicine (N=673)	Surgery (N=881)	Pediatrics (N=237)	Obstetrics-Gynecology (N=297)	Psychiatry (N=259)
			Mean					
Total[a]	3,366	$30.47	$18.21	$38.18	$29.04	$21.06	$30.70	$56.80
New England	211	30.64	16.85	35.39	27.44	19.73	27.00	49.43
Middle Atlantic	620	33.01	17.28	40.73	32.26	20.82	32.04	59.39
East North Central	541	27.48	16.84	36.46	26.28	20.23	25.91	55.74
West North Central	218	22.73	15.00	27.09	22.75	21.45	23.82	48.00
South Atlantic	550	31.22	18.74	41.49	26.21	18.81	32.40	56.61
East South Central	172	25.89	18.62	38.30	22.48	17.53	30.33	b
West South Central	284	30.10	17.42	39.44	28.64	20.74	33.04	56.95
Mountain	187	26.93	16.61	32.79	26.06	19.56	28.96	53.91
Pacific	583	35.33	23.36	39.94	36.24	27.77	34.18	61.87
		Standard Error of the Mean						
Total		.339	.283	.992	.509	.605	.580	.971
New England		1.236	.874	3.496	1.435	1.908	1.932	2.556
Middle Atlantic		.821	.537	1.982	1.292	1.347	1.386	2.480
East North Central		.802	.471	2.455	1.115	.939	1.244	3.068
West North Central		.986	.904	2.452	1.646	5.100	1.939	3.000
South Atlantic		.925	.952	3.281	1.017	.667	1.215	1.967
East South Central		1.108	1.040	3.249	1.587	.935	1.881	b
West South Central		1.145	.682	3.548	1.737	1.148	2.577	3.587
Mountain		1.116	.549	3.839	1.224	1.757	1.831	4.218
Pacific		.866	.902	2.448	1.503	2.421	1.490	1.787

[a] Total includes Radiology, Anesthesiology, and "Other" categories. [b] Data do not meet reliability standards.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 32—Average Fee for Initial Office Visit by Specialty and Location, 1979

			Location		
			Nonmetropolitan	Metropolitan	
	Total			Less than 1,000,000[b]	1,000,000 and over[c]
Specialty	N	Mean	(N = 579)	(N = 1186)	(N = 1601)
			Mean		
Total[a]	3,366	$30.47	$21.35	$28.57	$35.17
General Practice	765	18.21	15.82	18.03	20.43
Internal Medicine	673	38.18	30.63	35.64	41.43
Surgery	881	29.04	21.57	26.16	34.34
Pediatrics	237	21.06	17.20	18.98	23.57
Obstetrics-Gynecology	297	30.70	26.06	29.78	32.45
Psychiatry	259	56.80	43.53	57.32	57.74
		Standard Error of the Mean			
Total		.339	.701	.494	.524
General Practice		.283	.409	.487	.511
Internal Medicine		.992	3.857	1.387	1.339
Surgery		.509	.755	.610	.897
Pediatrics		.605	.939	.560	1.059
Obstetrics-Gynecology		.580	1.697	.979	.763
Psychiatry		.971	5.461	1.651	1.166

[a] Total includes Radiology, Anesthesiology, and "Other" categories. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 33—Average Fee for Follow-up Office Visit by Specialty, 1971, 1973-1976, 1978, 1979[a]

Specialty	Year						
	1971	1973	1974	1975	1976	1978	1979
General Practice	$6.93	$ 7.52	$ 8.75	$ 9.29	$10.65	$12.15	$13.67
Internal Medicine	9.96	11.13	12.28	13.56	15.52	16.83	19.89
Surgery	9.18	10.34	11.27	12.22	13.94	15.91	17.61
Pediatrics	7.89	8.65	10.38	11.07	12.52	13.72	15.65
Obstetrics-Gynecology	9.52	11.53	13.10	13.73	15.40	18.23	19.04

[a] A follow-up office visit is defined as "office visit, established patient, brief examination, evaluation and/or treatment, same or new illness."

Source: Periodic Survey of Physicians, 1971-1979. Center for Health Services Research and Development, American Medical Association.

Table 34—Average Fee for Follow-up Office Visit by Census Division and Specialty, 1979

	Total		Specialty					
Census Division	N	Mean	Gen.Prac. (N=772)	Int.Med. (N=699)	Surg. (N=868)	Ped. (N=241)	Ob./Gyn. (N=297)	Psych. (N=248)
			Mean					
Total[a]	3,369	$19.44	$13.67	$19.89	$17.61	$15.65	$19.04	$48.27
New England	209	20.55	13.80	18.43	19.16	15.13	16.75	45.48
Middle Atlantic	626	21.34	13.67	21.12	19.73	16.13	20.89	51.51
East North Central	544	17.04	12.80	17.38	16.07	15.71	17.15	40.88
West North Central	217	14.64	11.06	16.49	12.62	14.15	15.45	40.33
South Atlantic	549	20.23	13.88	21.46	16.60	14.95	20.52	46.58
East South Central	171	15.79	12.84	16.16	15.51	13.53	20.00	b
West South Central	282	18.54	12.82	20.02	17.29	14.65	18.52	45.18
Mountain	188	18.31	13.74	18.68	16.20	14.22	17.08	53.20
Pacific	583	22.15	16.81	22.51	19.82	18.66	19.75	53.00
		Standard Error of the Mean						
Total		.211	.125	.509	.236	.271	.410	.960
New England		.804	.596	.929	1.004	.623	.990	2.918
Middle Atlantic		.502	.304	.718	.657	.618	1.201	1.996
East North Central		.386	.211	.505	.542	.880	.770	2.951
West North Central		.509	.224	.720	.496	1.881	1.614	4.295
South Atlantic		.709	.374	2.658	.580	.473	1.064	1.926
East South Central		.513	.407	.659	.823	.336	1.813	b
West South Central		.658	.308	1.116	.766	.452	.508	3.979
Mountain		.827	.461	1.523	.747	1.211	.932	4.645
Pacific		.509	.314	1.154	.496	.770	.940	1.927

[a] Total Includes Radiology, Anesthesiology, and "Other" categories. [b] Data do not meet reliability standards.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 35—Average Fee for Follow-up Office Visit by Specialty and Location, 1979

			Location		
			Nonmetropolitan	Metropolitan	
	Total			Less than 1,000,000[b]	1,000,000 and over[c]
Specialty	N	Mean	(N = 579)	(N = 1190)	(N = 1600)
			Mean		
Total[a]	3,369	$19.44	$14.25	$17.66	$22.64
General Practice	772	13.67	12.01	13.50	15.23
Internal Medicine	699	19.89	18.32	17.26	21.89
Surgery	868	17.61	13.50	16.28	20.34
Pediatrics	241	15.65	12.63	14.36	17.34
Obstetrics-Gynecology	297	19.04	15.66	18.18	20.46
Psychiatry	248	48.27	34.53	45.57	50.69
		Standard Error of the Mean			
Total		.211	.553	.275	.319
General Practice		.125	.175	.189	.223
Internal Medicine		.509	3.528	.337	.488
Surgery		.236	.304	.326	.387
Pediatrics		.271	.388	.292	.427
Obstetrics-Gynecology		.410	.942	.699	.556
Psychiatry		.960	5.074	1.806	1.034

[a] Total includes Radiology, Anesthesiology, and "Other" categories. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Physicians' Professional Expenses

For the average physician, professional expenses rose 2.0% from 1977 to 1978 and are expected to rise 7.5% between 1978 and 1979. The percentage changes in professional expenses from 1977 to 1978 and the projected changes from 1978 to 1979 were, by specialty:

	1977-1978	1978-1979
● Psychiatry	25.4%	5.8%
● Surgery	5.0%	6.5%
● General Practice	3.7%	7.9%
● Obstetrics-Gynecology	1.6%	5.8%
● Internal Medicine	-1.8%	9.8%
● Anesthesiology	-2.3%	10.7%
● Pediatrics	-10.2%	4.8%

The following comments about the pattern of professional expenses in 1978 and 1979 are of interest:

- The average surgeon had the highest professional expenses in both 1978 and 1979 ($63,400 and $67,500, respectively).
- The average pyschiatrist had the lowest professional expenses in both 1978 and 1979 ($24,200 and $25,600, respectively).
- Physicians in the East South Central and Pacific census divisions had the highest professional expenses in 1978 ($53,100). Physicians in the New England census division had the lowest professional expense in 1978 ($31,100).
- On average, physicians in nonmetropolitan areas had relatively high professional expenses in 1978 ($52,500) while physicians in metropolitan areas of one million or more persons had relatively low professional expenses ($42,700).

Examination of selected categories of average professional expenses in 1978 reveals that the largest category is nonphysician payroll ($15,006), followed by office expenses ($7,392), professional liability insurance ($4,323), and medical equipment ($3,860). Other points of interest concerning selected professional expenses are the following:

- Anesthesiologists had the highest professional liability insurance expense ($9,800) while Pediatricians had the lowest ($1,977).
- Physicians in the Pacific census division had the highest mean professional liability insurance expense ($5,624) and those in the New England census division had the lowest ($3,062).
- Obstetricians and gynecologists had the highest average nonphysician payroll expense ($18,487) and psychiatrists had the lowest nonphysician payroll expense ($6,109).

Table 36—Average Fee for Follow-up Hospital Visit by Census Division and Specialty, 1979[a]

	Total		Specialty					
Census Division	N	Mean	Gen.Prac. (N=662)	Int.Med. (N=670)	Surg. (N=792)	Ped. (N=219)	Ob./Gyn. (N=253)	Psych. (N=174)
			Mean					
Total[a]	2,973	$25.56	$19.06	$25.11	$24.91	$23.32	$27.03	$48.60
New England	182	27.16	16.71	20.56	23.81	27.52	22.69	63.94
Middle Atlantic	516	29.02	19.19	27.78	29.34	27.00	32.36	57.32
East North Central	486	22.37	17.09	22.09	21.70	23.87	23.23	39.88
West North Central	207	19.33	16.00	18.29	21.94	19.58	17.78	32.44
South Atlantic	478	27.15	19.50	25.40	26.04	21.63	30.91	47.11
East South Central	158	20.12	16.54	18.97	20.18	16.86	20.07	b
West South Central	257	25.16	19.42	27.02	25.02	25.32	27.84	35.30
Mountain	171	23.56	20.25	21.94	22.35	15.78	27.52	62.17
Pacific	518	28.10	23.38	31.34	26.02	22.38	25.93	52.03
			Standard Error of the Mean					
Total		.325	.388	.586	.545	.839	.896	2.603
New England		2.319	1.672	1.373	1.622	3.034	2.507	21.235
Middle Atlantic		.815	1.013	1.244	1.657	2.089	2.534	5.023
East North Central		.679	.760	1.171	1.445	2.113	1.767	4.418
West North Central		.824	1.198	.883	2.016	4.286	1.535	5.677
South Atlantic		.802	1.035	1.563	1.436	1.820	2.613	3.175
East South Central		.952	1.016	1.514	2.060	3.095	1.962	b
West South Central		.921	1.315	2.358	1.520	3.456	2.593	3.813
Mountain		1.058	1.609	1.611	1.738	2.272	2.804	9.148
Pacific		.756	1.037	2.020	1.096	1.284	1.792	3.681

[a] Total includes Radiology, Anesthesiology and "Other" categories. [b] Data do not meet reliability standards.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 37—Average Fee for Follow-up Hospital Visit by Specialty and Location, 1979

	Total		Location		
			Nonmetropolitan	Metropolitan	
Specialty	N	Mean	(N = 521)	Less than 1,000,000[b] (N = 1072)	1,000,000 and over[c] (N = 1380)
			Mean		
Total[a]	2,973	$25.56	$19.24	$24.05	$29.12
General Practice	662	19.06	17.17	19.12	20.74
Internal Medicine	670	25.11	18.62	21.67	28.89
Surgery	792	24.91	18.91	23.23	28.80
Pediatrics	219	23.32	20.38	20.46	26.16
Obstetrics-Gynecology	253	27.03	23.48	24.10	29.83
Psychiatry	174	48.60	35.83	49.74	49.45
		Standard Error of the Mean			
Total		.325	.526	.576	.478
General Practice		.388	.604	.735	.657
Internal Medicine		.586	1.094	.815	.887
Surgery		.545	.912	.768	.932
Pediatrics		.839	2.577	1.327	1.137
Obstetrics-Gynecology		.896	2.739	1.124	1.380
Psychiatry		2.603	6.271	6.792	2.128

[a] Total includes Radiology, Anesthesiology, and "Other" categories. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 38—Average Fee for Appendectomy by Census Division and Specialty, 1979[a]

Census Division	Total		Specialty		
	N	Mean	Gen. Practice (N=146)	Surgery (N=293)	Ob./Gyn. (N=53)
				Mean	
Total[a]	546	$374.42	$336.02	$424.06	$382.51
New England	29	347.79	b	367.67	339.17
Mid Atlantic	66	391.15	b	430.37	364.29
East North Central	87	320.74	289.71	388.67	b
West North Central	55	298.42	271.60	314.79	b
South Atlantic	71	383.10	291.67	417.55	317.50
East South Central	39	297.54	292.31	340.74	b
West South Central	66	342.33	313.71	425.75	407.14
Mountain	38	396.21	341.94	433.37	b
Pacific	95	502.76	461.06	562.96	574.25
			Standard Error of the Mean		
Total		6.297	10.907	7.491	22.355
New England		21.909	b	26.010	28.297
Mid Atlantic		19.253	b	19.060	37.344
East North Central		12.781	24.762	9.836	b
West North Cental		15.638	22.310	24.668	b
South Atlantic		12.976	15.366	13.935	27.399
East South Central		15.632	18.859	18.104	b
West South Central		15.076	13.941	20.214	76.710
Mountain		14.074	23.732	12.752	b
Pacific		18.102	26.019	22.296	83.240

[a] Total includes Internal Medicine, Pediatrics, Anesthesiology, Psychiatry, and "Other" categories.

[b] Data do not meet reliability standards.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 39—Average Professional Expenses by Specialty, 1970-1979[a]

Specialty	Year									
	1970	1971	1972	1973	1974	1975	1976[c]	1977	1978	1979[c]
Total[b]	$24,300	$28,900	$31,300	$32,200	$34,000	$38,500	$42,400	$45,500	$46,400	$49,900
General Practice	24,200	32,100	34,500	34,000	36,700	38,600	42,400	46,100	47,800	51,600
Internal Medicine	25,000	28,300	31,300	34,000	35,800	40,400	45,600	45,600	44,800	49,200
Surgery	27,100	32,900	35,800	38,000	39,300	49,100	54,800	60,400	63,400	67,500
Pediatrics	24,900	28,500	30,000	32,400	30,000	34,600	36,600	39,100	35,100	36,800
Obst./Gynecology	27,700	33,300	36,500	37,200	41,900	48,500	54,400	60,900	61,900	65,500
Psychiatry	13,300	13,000	14,100	14,300	14,000	18,700	19,800	19,300	24,200	25,600
Anesthesiology	11,200	12,700	13,900	14,000	19,300	20,000	22,200	25,900	25,300	28,000

[a] Because of differences in sampling procedure, figures may not be consistent with previously published data for some years. [b] Physicians whose specialties were classified as Radiology and "Other" are included in this total. [c] Projected by respondents.

Source: Periodic Survey of Physicians, 1971-1979. Center for Health Services Research and Development, American Medical Association.

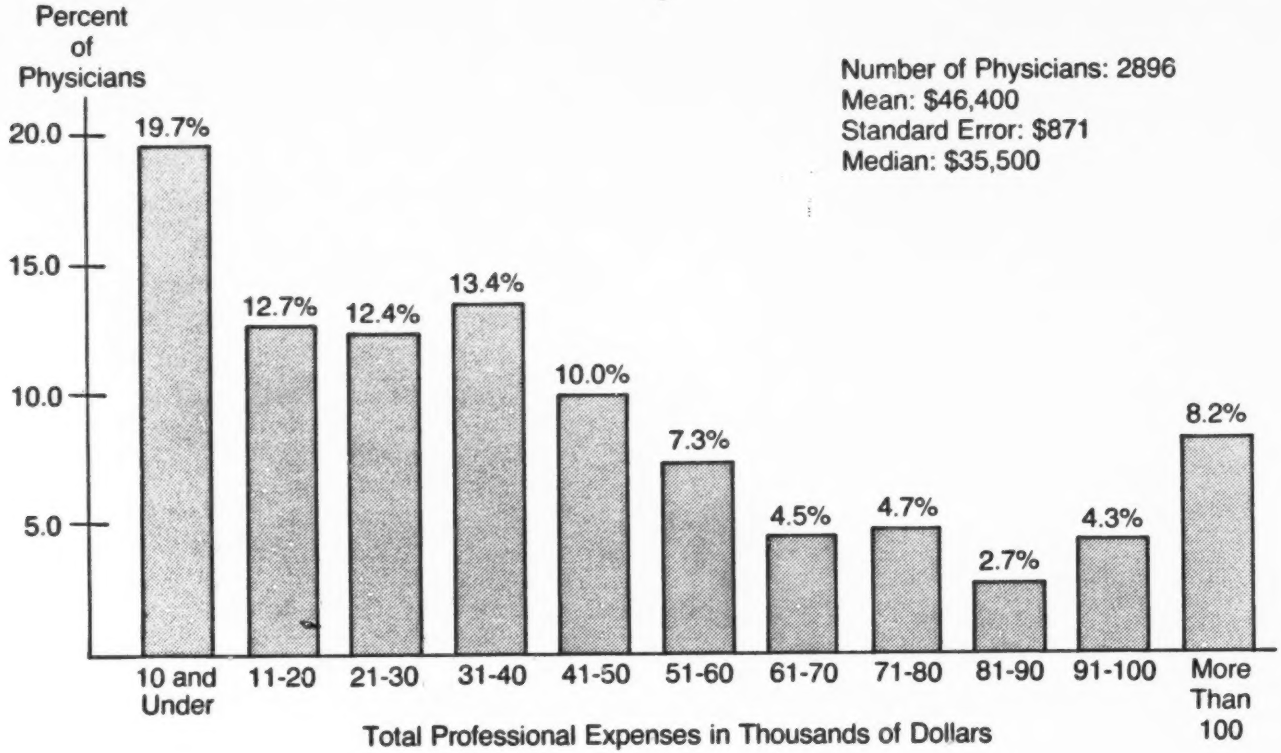
Table 40—Average Professional Expenses by Type of Practice and Specialty, 1978

Type of Practice	Total N	Total Mean	Specialty Gen.Prac. (N=606)	Int.Med. (N=505)	Surg. (N=642)	Ped. (N=186)	Ob./Gyn. (N=207)	Rad. (N=118)	Psych. (N=243)	Anes. (N=110)
						Mean				
Total[a]	2,896	$46,400	$47,800	$44,800	$63,400	$35,100	$61,900	$42,100	$24,200	$25,300
Solo	1,608	47,700	45,100	47,100	64,700	39,400	60,400	65,000	26,200	29,400
2 MD	271	60,100	65,500	54,100	70,100	38,300	77,100	39,500	b	b
3 MD	185	52,400	51,100	46,500	65,100	36,600	56,000	b	b	b
4 MD	144	47,900	49,700	40,000	66,100	44,900	63,300	16,400	b	b
5-7 MD	169	47,300	50,200	49,000	73,400	39,300	75,800	54,700	b	26,200
8-25 MD	152	47,100	46,900	48,500	73,800	32,300	69,600	40,300	b	25,800
26 MD & Over	95	28,200	23,000	18,200	40,700	17,100	b	b	b	16,000
					Standard Error of the Mean					
Total		871	1,653	1,560	2,408	2,142	3,292	5,399	1,672	2,425
Solo		1,130	1,727	1,911	3,599	3,307	3,968	12,569	1,947	3,955
2 MD		2,899	6,268	6,926	5,459	5,365	9,353	14,275	b	b
3 MD		3,488	6,815	6,326	7,218	8,096	10,331	b	b	b
4 M		3,735	7,313	6,002	12,091	8,011	12,751	6,619	b	b
5-7 MD		3,660	7,269	7,151	7,340	9,298	25,228	18,799	b	6,339
8-25 MD		4,938	12,295	8,192	11,903	7,591	16,121	11,069	b	5,952
26 MD & Over		3,937	8,811	4,681	9,303	7,469	b	b	b	4,359

[a] Total includes "Other" and "Not Specified" categories. [b] Data do not meet reliability standards.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Figure 4—Percentage Distribution of Physicians by Professional Expenses, 1978



Number of Physicians: 2896
Mean: $46,400
Standard Error: $871
Median: $35,500

Source: *Thirteenth Periodic Survey of Physicians.* March 1979. Center for Health Services Research and Development, American Medical Association.

Physicians' Net Incomes

In 1978, the average physician's net income from medical practice rose 7.0%, and it is expected to rise 4.7% in 1979 based on projections by physician respondents. The percentage increases in average net income from 1977 to 1978 and the expected increases from 1978 to 1979 were, by specialty:

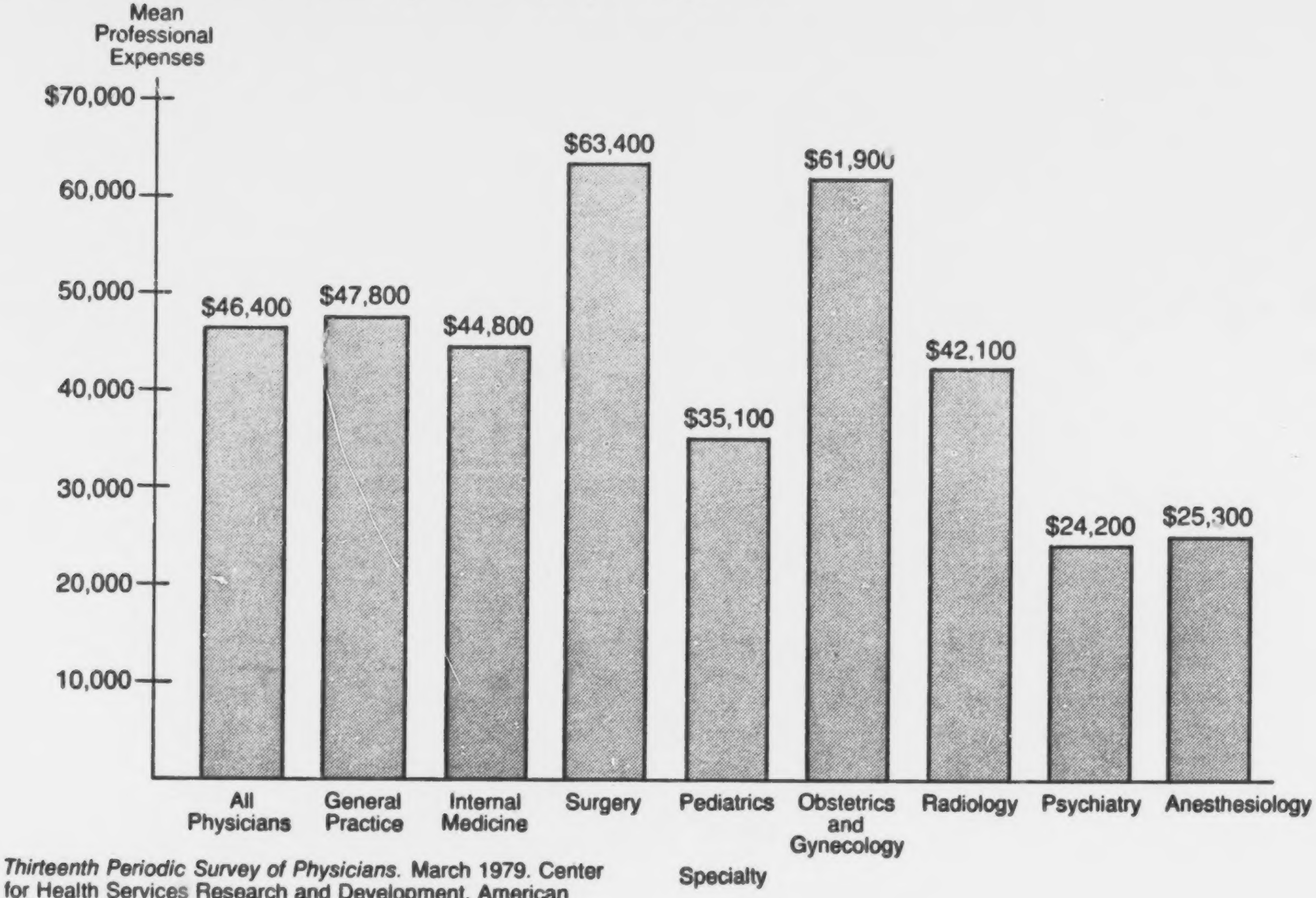
	1977-1978	1978-1979
• Anesthesiology	13.3%	5.3%
• Surgery	11.6%	4.8%
• General Practice	6.6%	1.6%
• Pediatrics	6.2%	6.3%
• Psychiatry	4.1%	6.0%
• Internal Medicine	3.7%	4.7%

Net incomes from medical practice show consistent patterns by census divisions in 1978 and as projected for 1979. Physicians in the East South Central census division had the highest mean net income ($79,700 and $85,100 in 1978 and 1979, respectively). Further, physicians in the New England census division had the lowest mean net income ($54,900 and $57,800 in 1978 and 1979, respectively). Other features of net income in 1978 include:

- The highest 1978 net average income occurred for phsyicians in metropolitan areas of less than one million persons ($68,100) followed by physicians in nonmetropolitan areas ($64,400) and physicians in metropolitan areas of one million or more persons ($63,900).
- Physicans age 46 through 50 earned the highest average net income in 1978 ($78,500) while physicians age 35 and under earned the least net income in 1978 ($49,000).
- Physicians age 46 through 50 earned the highest average net income in 1978 in all specialties except Obstetrics and Gynecology, Radiology, and Psychiatry.

Exactly one-half of physicians reported that their medical practice was a corporation in 1979. This percentage varied from a high of 70% for anesthesiologists to a low of 29% for psychiatrists. Further, the 1978 net income for incorporated physicians ($77,100) exceeded that for physicians who are not incorporated ($54,400).

Figure 5—Mean Professional Expenses by Specialty, 1978



Source: *Thirteenth Periodic Survey of Physicians*. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 41- -Average Professional Expenses by Census Division and Specialty, 1978

	Total		Specialty							
Census Division	N	Mean	Gen.Prac. (N=606)	Int.Med. (N=505)	Surg. (N=642)	Ped. (N=186)	Ob./Gyn. (N=207)	Rad. (N=118)	Psych. (N=250)	Anes. (N=110)
			Mean							
Total[a]	2,896	$46,400	$47,800	$44,800	$63,400	$35,100	$61,900	$42,100	$24,200	$25,300
New England	176	31,100	34,200	31,800	40,600	35,100	45,300	27,500	18,700	9,600
Mid Atlantic	510	39,600	29,600	40,200	60,800	34,600	46,000	51,800	21,700	31,100
E. N. Central	456	45,800	44,100	42,500	74,100	39,300	54,600	13,400	27,600	21,900
W. N. Central	204	47,400	52,600	39,600	65,500	29,300	73,100	34,100	26,000	29,100
South Atlantic	452	45,800	52,600	47,000	58,700	29,400	62,200	46,600	29,800	14,200
E. S. Central	133	53,100	70,900	58,000	55,100	40,600	73,000	16,900	b	b
W. S. Central	239	52,400	58,400	58,000	54,100	50,600	67,100	25,100	26,700	30,200
Mountain	167	48,700	50,300	40,200	63,700	b	70,600	15,800	27,500	b
Pacific	559	53,100	50,900	52,400	73,500	32,600	73,800	84,500	20,200	28,400
			Standard Error of the Mean							
Total		871	1,653	1,560	2,408	2,142	3,292	5,399	1,672	2,425
New England		2,005	8,089	4,545	3,835	6,652	10,330	9,945	2,684	3,139
Mid Atlantic		1,733	3,121	2,948	4,590	5,370	6,537	16,004	3,279	10,278
E. N. Central		2,333	3,002	4,010	8,581	4,124	6,892	4,546	5,632	3,979
W. N. Central		3,229	4,826	5,378	10,628	7,587	14,713	8,888	5,419	9,553
South Atlantic		1,942	4,588	3,600	4,166	4,188	9,780	11,592	5,675	2,923
E. S. Central		4,567	13,760	7,820	8,449	7,632	17,570	4,356	b	b
W. S. Central		3,348	5,316	8,490	5,492	10,990	12,771	9,280	5,497	8,295
Mountain		2,853	4,899	5,924	6,562	b	8,350	6,645	5,197	b
Pacific		2,395	3,972	4,264	6,941	5,113	8,563	20,866	2,476	4,759

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 42—Average Professional Expenses by Specialty and Location, 1978

	Total		Location		
			Nonmetropolitan	Metropolitan	
Specialty	N	Mean	(N=477)	Less than 1,000,000[b] (N=1004)	1,000,000 and over[c] (N=1415)
				Mean	
Total[a]	2,896	$46,400	$52,500	$48,700	$42,700
General Practice	606	47,800	53,900	51,500	40,000
Internal Medicine	505	44,800	51,700	43,200	44,300
Surgery	642	63,400	69,000	64,300	60,500
Pediatrics	186	35,100	36,800	36,800	33,500
Obstetrics-Gynecology	207	61,900	63,000	65,400	59,300
Radiology	118	42,100	36,000	37,000	48,200
Psychiatry	250	24,200	26,200	27,100	22,800
Anesthesiology	110	25,300	19,700	24,600	27,000
				Standard Error of the Mean	
Total		871	2,078	1,481	1,250
General Practice		1,653	2,957	3,096	2,527
Internal Medicine		1,560	4,186	2,704	2,132
Surgery		2,408	5,419	3,302	4,128
Pediatrics		2,142	8,462	3,480	2,752
Obstetrics-Gynecology		3,292	7,689	5,691	4,635
Radiology		5,399	10,402	8,318	8,770
Psychiatry		1,672	12,325	3,966	1,622
Anesthesiology		2,425	4,611	4,121	3,558

[a] Total includes "Other" category. [b] All counties in SMSAs with 50,000 to 999,999 inhabitants and all counties considered potential SMSAs. [c] All counties in SMSAs with 1,000,000 or more.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 43—Average of Selected Components of Professional Expenses by Specialty, 1978

Specialty	Total Expense		Selected Expenses			
	N	Mean	Nonphysician Payroll (N=2964)	Professional Insurance (N=2964)	Medical Equipment (N=2964)	Office Expenses (N=2964)
			Mean			
Total[a]	2,896	$46,400	$15,006	$4,323	$3,860	$7,392
General Practice	606	47,800	17,523	2,544	3,737	7,787
Internal Medicine	505	44,800	15,820	2,304	3,865	7,685
Surgery	642	63,400	17,551	7,187	4,747	8,930
Pediatrics	186	35,100	13,636	1,977	2,750	6,936
Obstetrics-Gynecology	207	61,900	18,487	8,304	3,722	8,618
Radiology	118	42,100	14,311	3,501	6,724	7,784
Psychiatry	250	24,200	6,109	1,982	2,395	5,434
Anesthesiology	110	25,300	6,342	9,800	790	1,618
		Standard Error of the Mean				
Total		871	385	119	169	199
General Practice		1,653	881	107	277	449
Internal Medicine		1,733	871	95	339	444
Surgery		2,408	809	234	312	456
Pediatrics		2,142	1,236	110	455	827
Obstetrics-Gynecology		3,292	1,522	407	390	647
Radiology		5,399	2,703	326	1,433	1,828
Psychiatry		1,672	754	811	452	362
Anesthesiology		2,425	1,505	1,020	183	290

[a] Total includes "Other" category.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Service Research and Development, American Medical Association.

Table 44—Average of Selected Components of Professional Expenses by Census Division, 1978

Census Division	Total Expense		Selected Expense			
	N	Mean	Nonphysician Payroll (N=2964)	Professional Insurance (N=2964)	Medical Equipment (N=2964)	Office Expenses (N=2964)
			Mean			
Total	2,896	$46,400	$15,006	$4,323	$3,860	$7,392
New England	176	31,100	10,968	3,062	2,739	5,797
Middle Atlantic	510	39,600	11,830	4,438	3,239	6,526
East North Central	456	45,800	15,335	5,033	3,271	7,113
West North Central	204	47,400	16,771	3,564	4,378	7,939
South Atlantic	452	45,800	16,625	3,147	3,841	7,898
East South Central	133	53,100	16,386	3,417	5,777	8,944
West South Central	239	52,400	18,197	3,393	5,444	7,745
Mountain	167	48,700	16,142	5,458	3,749	7,818
Pacific	559	53,100	16,215	5,624	4,075	7,772
		Standard Error of the Mean				
Total		871	385	119	169	199
New England		2,005	1,070	271	423	565
Middle Atlantic		1,733	752	210	291	363
East North Central		2,333	1,026	511	268	530
West North Central		3,229	1,662	384	795	1,207
South Atlantic		1,942	970	160	372	480
East South Central		4,567	1,934	241	1,845	1,157
West South Central		3,348	1,607	278	825	716
Mountain		2,853	1,290	684	378	934
Pacific		2,395	974	256	353	430

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services and Development, American Medical Association.

Table 45—Average Net Income from Medical Practice by Specialty, 1970-1979[a]

Specialty	1970	1971	1972	1973	1974	1975	1976[c]	1977	1978	1979[c]
Total[b]	$41,800	$45,300	$47,200	$48,600	$52,000	$56,400	$59,500	$61,200	$65,500	$68,600
General Practice	33,900	39,800	41,300	41,900	44,700	45,400	47,400	51,200	54,600	55,500
Internal Medicine	40,300	42,900	44,700	47,800	51,400	57,000	60,500	61,500	63,800	66,800
Surgery	50,700	54,000	56,000	57,200	60,500	68,200	73,200	74,000	82,600	86,600
Pediatrics	34,800	38,500	38,900	41,200	42,100	44,300	47,000	48,200	51,200	54,400
Obst./Gynecology	47,100	51,100	53,200	55,400	61,700	63,300	65,800	69,900	70,300	73,600
Psychiatry	39,900	37,200	39,100	38,500	41,300	44,800	47,600	48,200	50,200	53,200
Anesthesiology	39,400	47,300	49,500	48,100	54,400	57,100	60,100	65,500	74,200	78,100

Year (spanning header over 1970–1979 columns)

[a] Because of differences in sampling procedure, figures may not be consistent with previously published data for some years. [b] Physicians whose specialties were classified as Radiology and "Other" are included in this total. [c] Projected by respondents.

Source: Periodic Survey of Physicians, 1970-1979. Center for Health Services Research and Development, American Medical Association.

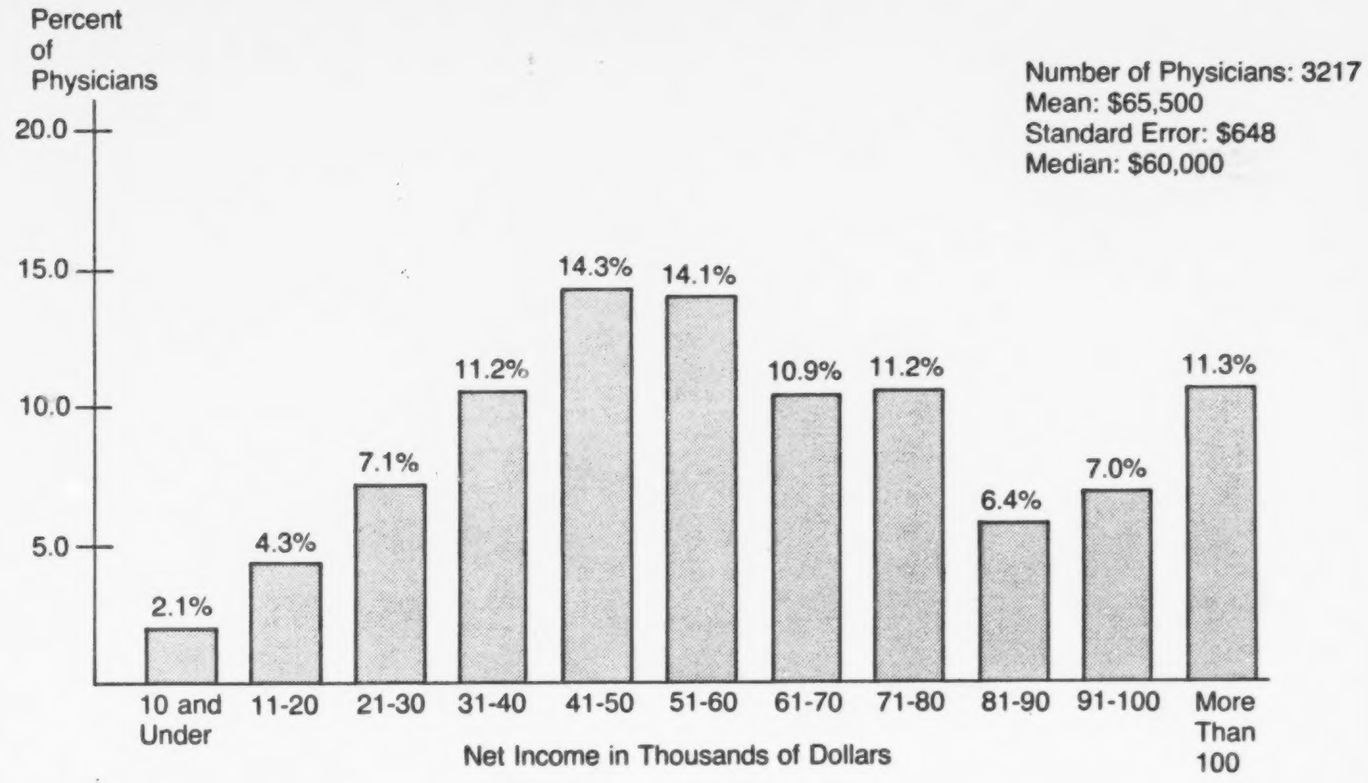
Table 46—Average Net Income from Medical Practice by Census Division and Specialty, 1978

Census Division	Total		Specialty							
	N	Mean	Gen.Prac. (N=651)	Int.Med. (N=574)	Surg. (N=700)	Ped. (N=210)	Ob./Gyn. (N=254)	Rad. (N=142)	Psych. (N=261)	Anes. (N=121)
			Mean							
Total[a]	3,217	$65,500	$54,600	$63,800	$82,600	$51,200	$70,300	$81,500	$50,200	$74,200
New England	199	54,900	31,600	55,700	64,900	38,900	62,300	72,700	45,500	60,400
Mid Atlantic	552	59,100	41,400	59,800	84,000	47,100	57,400	78,000	48,900	54,700
E. N. Central	514	69,900	55,200	66,000	94,700	58,700	75,800	94,600	55,000	84,400
W. N. Central	224	70,200	59,400	67,600	87,000	43,800	86,800	101,000	57,300	84,700
South Atlantic	502	64,900	54,100	64,400	83,600	48,900	67,100	77,600	51,000	69,500
E. S. Central	153	79,700	72,400	68,500	96,100	53,800	78,000	92,400	b	85,000
W. S. Central	267	70,900	66,100	72,400	77,000	50,200	87,000	80,200	46,500	82,200
Mountain	188	61,800	51,400	57,600	72,800	53,400	81,600	65,600	60,100	57,700
Pacific	618	64,900	56,800	66,000	78,100	59,100	63,400	75,600	47,300	76,100
		Standard Error of the Mean								
Total		648	1,110	1,381	1,816	1,609	2,157	2,897	1,366	2,706
New England		2,080	3,748	4,386	4,755	4,297	6,679	9,131	3,890	7,904
Mid Atlantic		1,636	2,441	2,911	5,263	4,293	3,561	5,456	3,098	5,905
E. N. Central		1,738	2,288	3,786	5,239	5,163	5,303	9,655	3,889	8,837
W. N. Central		2,581	3,763	5,792	6,639	4,499	16,908	14,611	5,103	8,964
South Atlantic		1,643	2,654	3,274	5,308	2,653	4,120	7,520	3,339	7,475
E. S. Central		3,409	7,821	8,668	7,257	6,095	11,226	10,595	b	7,155
W. S. Central		2,255	3,360	5,284	6,196	6,060	8,801	9,752	5,054	9,531
Mountain		2,227	4,188	4,559	5,011	8,641	9,152	9,168	4,681	9,404
Pacific		1,301	2,496	3,264	3,237	3,858	4,532	5,376	3,027	3,559

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

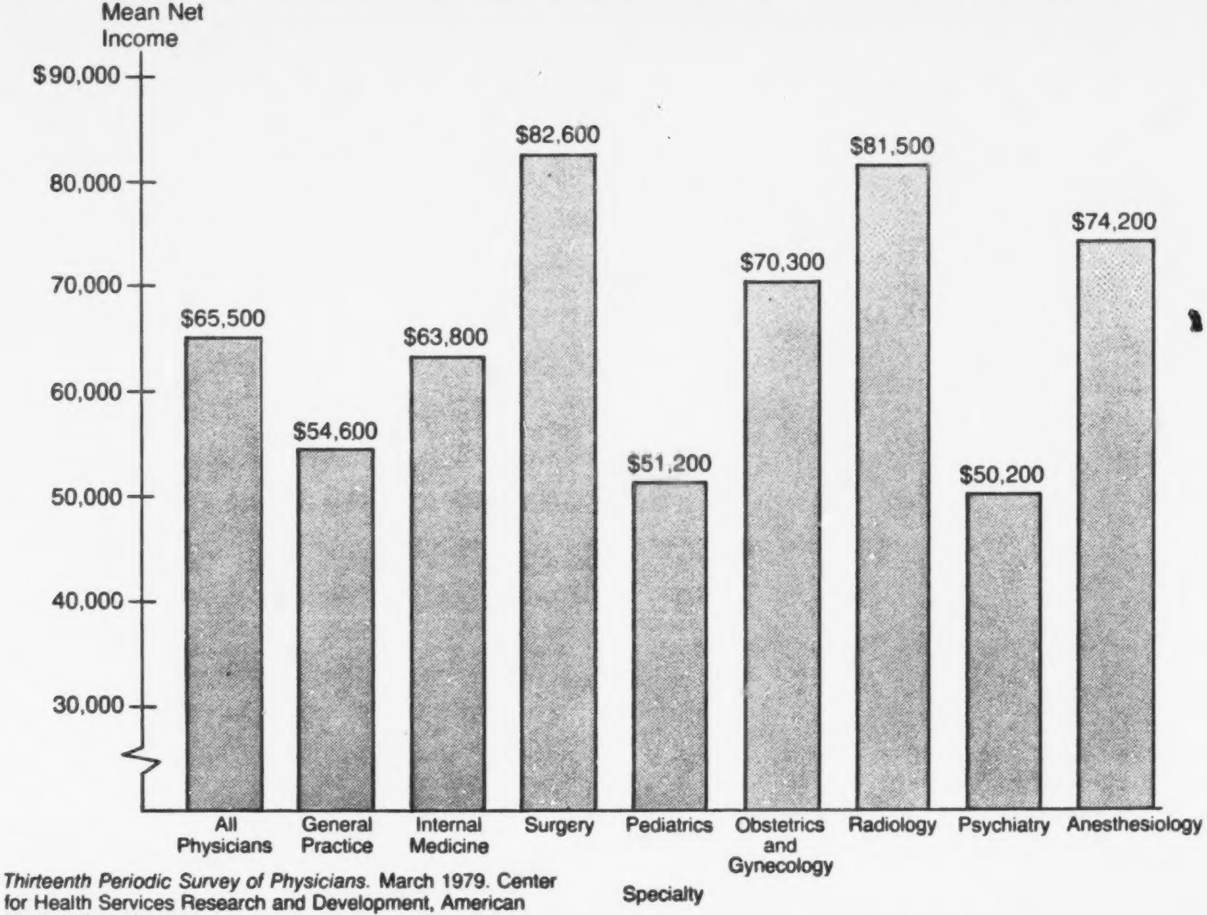
Figure 6—Percentage Distribution of Physicians by Net Income from Medical Practice, 1978



Number of Physicians: 3217
Mean: $65,500
Standard Error: $648
Median: $60,000

Source: *Thirteenth Periodic Survey of Physicians.* March 1979. Center for Health Services Research and Development, American Medical Association.

Figure 7 — Mean Net Income from Medical Practice by Specialty, 1978



Source: *Thirteenth Periodic Survey of Physicians*. March 1979. Center for Health Services Research and Development, American Medical Association.

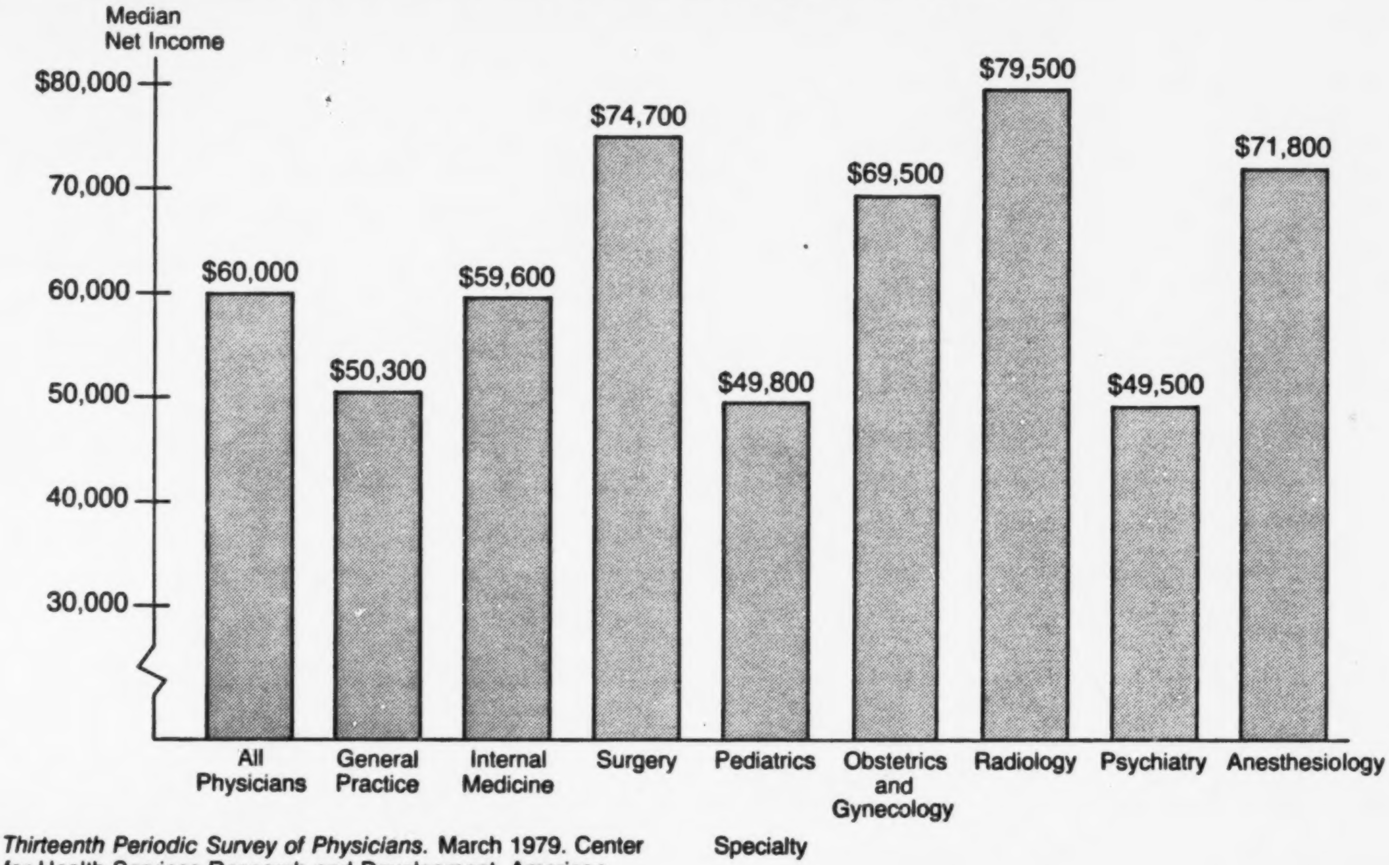
Table 47—Median Net Income from Medical Practice by Census Division and Specialty, 1978

Census Division	Total		Specialty							
	N	Median	Gen.Prac. (N=651)	Int.Med. (N=574)	Surg. (N=700)	Ped. (N=210)	Ob./Gyn. (N=254)	Rad. (N=142)	Psych. (N=261)	Anes. (N=121)
			Median							
Total[a]	3,217	$60,000	$50,300	$59,600	$74,700	$49,800	$69,500	$79,500	$49,500	$71,800
New England	199	50,500	32,500	50,300	59,800	40,000	64,000	66,000	40,000	58,000
Mid Atlantic	552	51,900	39,700	53,300	79,800	44,800	53,500	74,500	49,600	55,000
E. N. Central	514	62,800	51,800	58,500	80,100	54,000	74,000	97,000	49,000	81,000
W. N. Central	224	64,000	55,500	60,300	75,500	38,500	74,000	99,500	57,000	85,000
South Atlantic	502	60,000	50,400	60,100	79,600	50,000	64,300	70,500	50,200	70,500
E. S. Central	153	74,700	60,300	70,000	83,500	49,000	79,000	100,000	b	98,100
W. S. Central	267	66,000	61,000	70,300	70,200	48,300	84,000	82,500	44,000	73,000
Mountain	188	57,500	49,700	53,500	70,000	50,000	73,000	54,000	59,500	66,500
Pacific	618	60,000	54,100	64,900	69,600	59,600	60,100	72,500	44,700	75,300

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Figure 8—Median Net Income from Medical Practice by Specialty, 1978



Source: *Thirteenth Periodic Survey of Physicians.* March 1979. Center for Health Services Research and Development, American Medical Association.

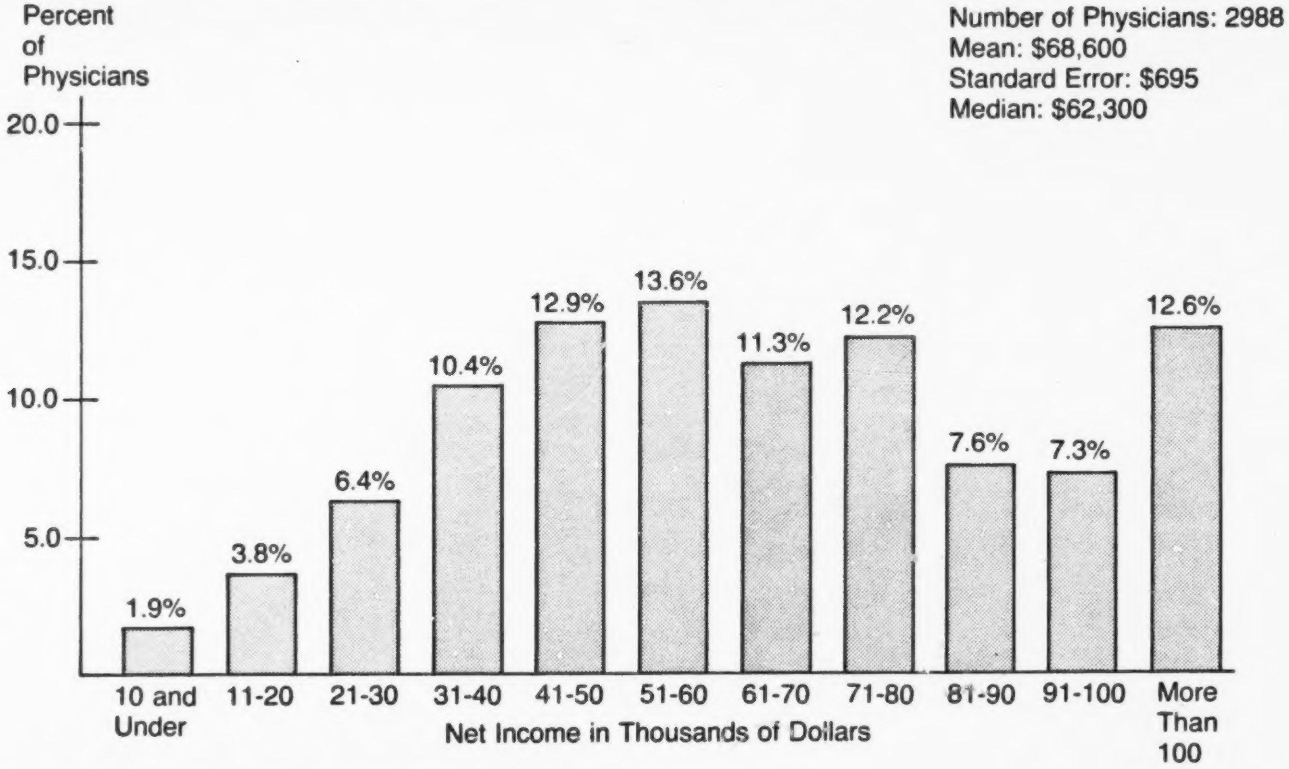
Table 48—Average Projected Net Income from Medical Practice by Census Division and Specialty, 1979

Census Division	Total		Specialty							
	N	Mean	Gen.Prac. (N=600)	Int.Med. (N=517)	Surg. (N=657)	Ped. (N=199)	Ob./Gyn. (N=241)	Rad. (N=130)	Psych. (N=243)	Anes. (N=111)
			Mean							
Total[a]	2,988	$68,600	$55,500	$66,800	$86,600	$54,400	$73,600	$86,200	$53,200	$78,100
New England	179	57,800	34,800	56,800	68,500	39,400	64,500	70,500	46,700	65,800
Mid Atlantic	507	61,900	41,700	62,800	87,100	49,200	59,300	82,500	51,600	57,000
E. N. Central	472	73,000	54,800	70,100	98,300	61,000	78,300	101,400	61,300	90,100
W. N. Central	208	74,200	62,000	69,600	93,400	46,300	92,000	98,500	59,300	99,300
South Atlantic	476	67,100	55,700	69,200	84,700	53,400	70,900	87,300	51,200	64,000
E. S. Central	144	85,100	70,800	71,900	104,800	56,600	86,100	99,300	b	87,100
W. S. Central	250	75,800	68,300	80,500	81,800	55,600	92,700	84,400	52,700	88,100
Mountain	177	64,400	52,200	61,700	76,000	57,400	86,400	65,200	58,500	55,800
Pacific	575	67,400	57,100	66,000	82,900	61,600	65,800	81,800	51,300	80,200
			Standard Error of the Mean							
Total		695	1,144	1,522	1,936	1,713	2,291	2,987	1,541	2,892
New England		2,235	3,768	5,034	5,061	5,352	6,766	9,726	3,878	8,972
Mid Atlantic		1,727	2,452	3,007	5,343	4,755	3,528	5,971	3,432	6,498
E. N. Central		1,873	2,366	4,623	5,488	5,231	5,494	9,587	5,111	8,812
W. N. Central		2,790	3,651	6,206	7,472	4,890	22,145	12,216	6,698	12,215
South Atlantic		1,680	2,912	3,635	5,306	2,900	4,402	8,456	2,947	4,262
E. S. Central		3,892	7,540	10,540	9,035	6,866	10,300	10,191	b	8,441
W. S. Central		2,468	3,495	6,650	6,893	6,106	8,482	12,063	6,275	10,691
Mountain		2,249	3,637	5,298	4,268	9,217	10,893	8,629	5,217	8,716
Pacific		1,420	2,714	3,205	3,745	4,016	4,737	5,787	3,454	3,589

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

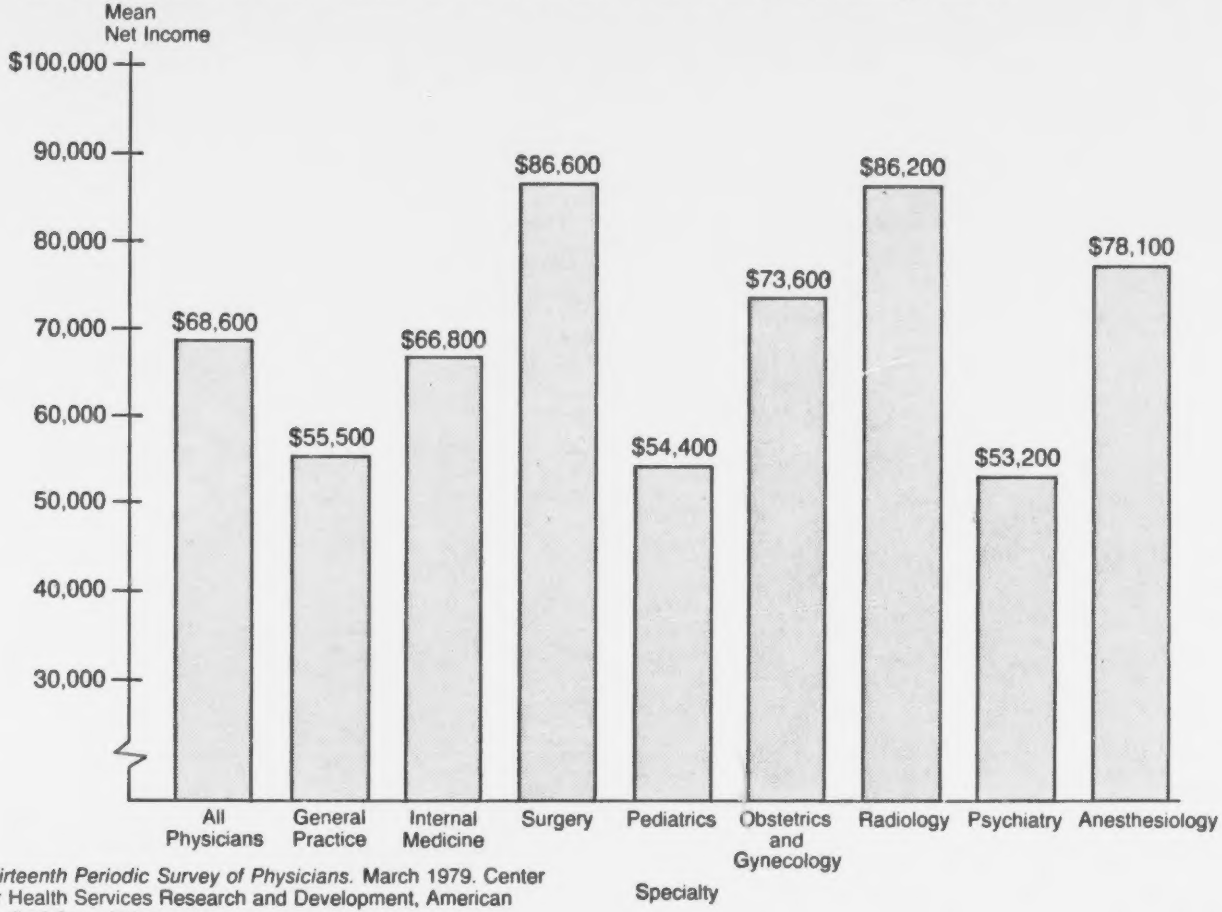
Figure 9—Percentage Distribution of Physicians by Projected Net Income from Medical Practice, 1979



Number of Physicians: 2988
Mean: $68,600
Standard Error: $695
Median: $62,300

Source: *Thirteenth Periodic Survey of Physicians.* March 1979. Center for Health Services Research and Development, American Medical Association.

Figure 10—Mean Projected Net Income from Medical Practice by Specialty, 1979



Source: *Thirteenth Periodic Survey of Physicians.* March 1979. Center for Health Services Research and Development, American Medical Association.

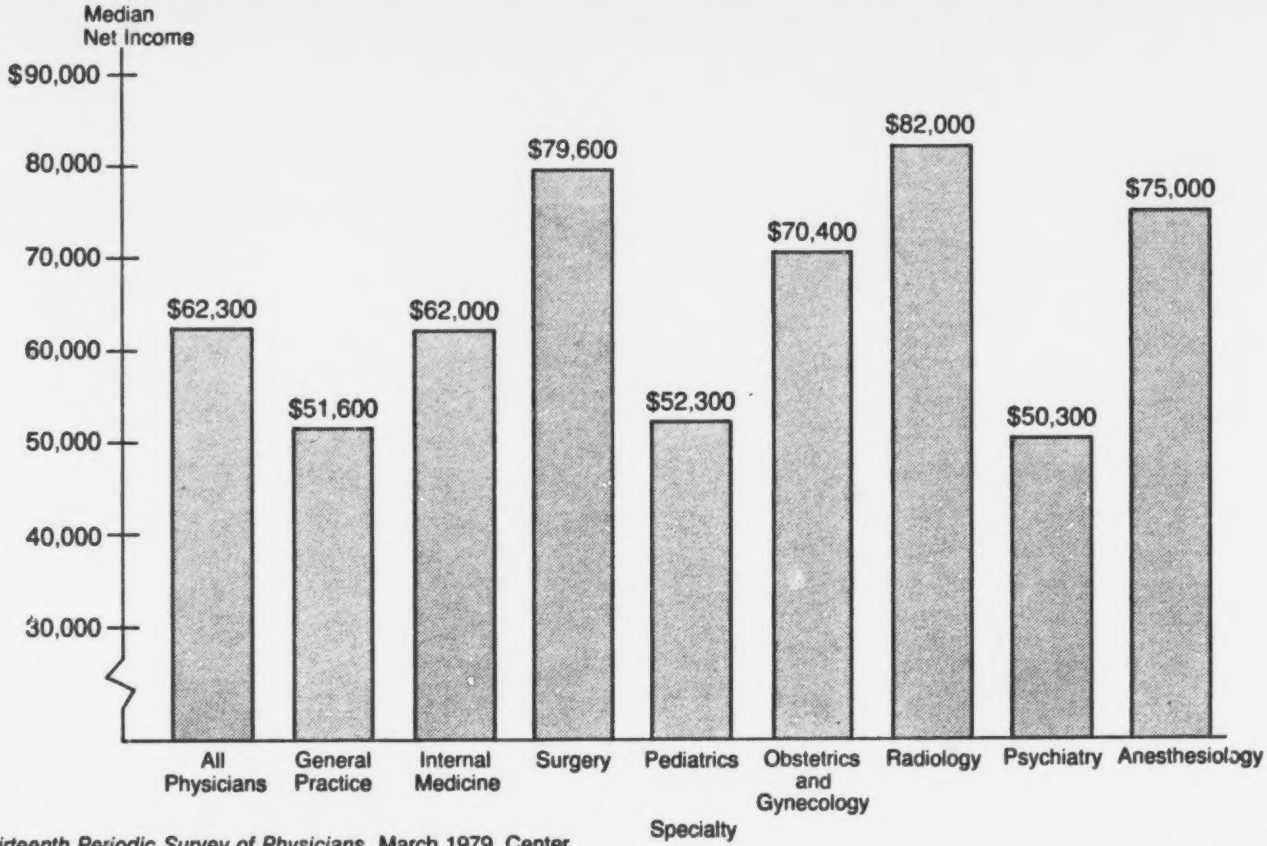
Table 49—Median Projected Net Income from Medical Practice by Census Division and Specialty, 1979

Census Division	Total		Specialty							
	N	Median	Gen.Prac. (N=600)	Int.Med. (N=517)	Surg. (N=657)	Ped. (N=199)	Ob./Gyn. (N=241)	Rad. (N=130)	Psych. (N=243)	Anes. (N=111)
			Median							
Total[a]	2,988	$62,300	$51,600	$62,000	$79,600	$52,300	$70,400	$82,000	$50,300	$75,000
New England	179	51,800	36,000	52,300	60,300	31,500	69,500	66,500	44,500	65,500
Mid Atlantic	507	55,100	39,800	58,000	80,100	49,000	55,500	79,800	47,000	51,000
E. N. Central	472	66,000	52,400	64,900	80,500	55,000	75,500	98,800	52,000	87,000
W. N. Central	208	65,700	56,000	65,000	80,000	38,500	60,500	98,700	55,500	86,500
South Atlantic	476	62,800	54,700	64,000	80,000	52,000	73,500	81,000	50,300	66,000
E. S. Central	144	74,500	60,300	63,500	95,500	48,000	82,500	119,700	b	95,000
W. S. Central	250	70,000	61,000	75,500	70,000	48,500	90,500	96,000	59,700	75,000
Mountain	177	59,800	50,200	59,500	80,000	52,000	80,500	57,000	54,500	61,500
Pacific	575	62,100	54,500	62,300	75,200	60,000	60,300	82,000	49,800	76,500

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Figure 11—Median Projected Net Income from Medical Practice by Specialty, 1979



Source: *Thirteenth Periodic Survey of Physicians.* March 1979. Center for Health Services Research and Development, American Medical Association.

Table 50—Average Net Income from Medical Practice by Specialty and Location, 1978

Specialty	Total		Location		
			Nonmetropolitan	Metropolitan	
	N	Mean	(N=551)	Less than 1,000,000[b] (N=1129)	1,000,000 and over[c] (N=1537)
			Mean		
Total[a]	3,217	$65,500	$64,400	$68,100	$63,900
General Practice	651	54,600	57,700	56,300	50,300
Internal Medicine	574	63,800	69,900	63,100	63,000
Surgery	700	82,600	74,500	86,000	82,900
Pediatrics	210	51,200	45,800	50,000	53,600
Obstetrics-Gynecology	254	70,300	77,100	71,700	67,900
Radiology	142	81,500	98,600	75,900	80,700
Psychiatry	261	50,200	54,300	48,100	50,700
Anesthesiology	121	74,200	57,100	81,600	73,800
		Standard Error of the Mean			
Total		648	1,412	1,177	912
General Practice		1,110	1,832	2,254	1,685
Internal Medicine		1,381	3,970	2,480	1,823
Surgery		1,816	3,619	3,103	2,733
Pediatrics		1,609	4,659	2,372	2,422
Obstetrics-Gynecology		2,157	7,164	3,716	2,818
Radiology		2,897	8,423	4,174	4,280
Psychiatry		1,366	6,566	2,457	1,695
Anesthesiology		2,706	5,379	4,514	3,825

[a] Total includes "Other" category. [b] All counties in SMSAs with 50,000 to 999,999 inhabitants and all counties considered potential SMSAs. [c] All counties in SMSAs with 1,000,000 or more inhabitants.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 51—Median Net Income from Medical Practice by Specialty and Location, 1978

			Location		
			Nonmetropolitan	Metropolitan	
	Total			Less than 1,000,000[b]	1,000,000 and over[c]
Specialty	N	Median	(N=551)	(N=1129)	(N=1537)
			Median		
Total[a]	3,217	$60,000	$59,700	$61,400	$59,700
General Practice	651	50,300	52,400	50,900	48,100
Internal Medicine	574	59,600	64,500	58,500	58,500
Surgery	700	74,700	65,100	79,800	74,800
Pediatrics	210	49,800	43,000	49,800	50,400
Obstetrics-Gynecology	254	69,500	72,800	69,900	61,700
Radiology	142	79,500	90,300	68,000	79,700
Psychiatry	261	49,500	47,500	45,100	50,100
Anesthesiology	121	71,800	55,200	83,000	70,500

[a] Total includes "Other" category. [b] Includes all counties in SMSAs with 50,000 to 999,999 inhabitants and all counties considered potential SMSAs. [c] Includes all counties in SMSAs with 1,000,000 or more inhabitants

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 52—Average Net Income from Medical Practice by Age of Physician and Specialty, 1978

	Total		Specialty							
Age of Physician	N	Mean	Gen. Prac. (N=651)	Int. Med. (N=574)	Surg. (N=700)	Ped. (N=210)	Ob./ Gyn. (N=254)	Rad. (N=142)	Psych. (N=261)	Anes. (N=121)
			Mean							
Total[a]	3,217	$65,500	$54,600	$63,800	$82,600	$51,200	$70,300	$81,500	$50,200	$74,200
Less than 35	247	49,000	49,900	49,000	52,900	41,200	47,600	55,000	35,700	68,900
36-40	466	64,400	51,400	61,800	80,800	53,400	65,700	87,800	46,300	67,800
41-45	442	76,300	63,400	71,700	93,800	49,100	87,300	75,900	57,400	81,000
46-50	440	78,500	64,700	78,200	97,900	62,800	80,300	84,800	55,500	93,100
51-60	861	70,600	61,600	68,800	86,900	56,000	76,900	93,600	55,000	73,100
61 and Over	761	51,900	45,100	54,000	65,600	39,400	50,700	67,900	40,500	60,200
			Standard Error of the Mean							
Total		648	1,110	1,381	1,816	1,609	2,157	2,897	1,366	2,706
Less than 35		1,635	3,425	3,303	5,678	3,581	4,598	16,533	3,869	11,035
36-40		1,658	3,196	3,269	4,616	3,509	4,631	7,389	3,448	6,363
41-45		1,756	2,635	3,473	4,126	5,775	7,283	5,640	3,511	4,972
46-50		1,905	3,386	3,665	5,249	4,775	3,786	6,010	3,123	9,917
51-60		1,231	1,970	2,853	3,600	2,678	4,306	5,734	2,565	4,386
61 and Over		1,182	1,940	3,016	3,157	3,291	3,563	5,677	2,668	5,848

[a] Total includes "Other" category.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Table 53—Percentage of Physicians who are Incorporated by Census Division and Specialty, 1979

	Total		Specialty							
			Gen. Prac. (N=888)	Int. Med. (N=798)	Surg. (N=1023)	Ped. (N=288)	Ob./ Gyn. (N=331)	Rad. (N=209)	Psych. (N=328)	Anes. (N=166)
Census Division	N	Percent	Percent							
Total[a]	4,460	50%	31%	48%	65%	40%	66%	69%	29%	70%
New England	273	38	8	36	52	21	72	59	12	62
Mid Atlantic	784	42	17	44	63	35	61	62	27	55
E. N. Central	720	54	38	53	72	54	66	71	40	66
W. N. Central	318	57	35	60	68	63	85	88	44	71
South Atlantic	718	53	29	53	67	40	69	76	38	59
E. S. Central	220	44	31	31	56	44	53	60	b	56
W. S. Central	352	52	42	51	59	61	62	46	24	93
Mountain	251	57	32	40	67	36	80	89	36	100
Pacific	824	49	33	48	70	27	57	71	18	74

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

Appendix

1979 Periodic Survey of Physicians Questionnaire

PERIODIC SURVEY OF PHYSICIANS

CENTER FOR HEALTH SERVICES RESEARCH AND DEVELOPMENT

American Medical Association
535 North Dearborn Street
Chicago, Illinois 60610

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Dear Doctor:

In its efforts to obtain reliable information on the practice of medicine, the American Medical Association instituted the Periodic Survey of Physicians in 1966. Results from each survey have been published annually in the Profile of Medical Practice. The cooperation exhibited by the responding physicians demonstrates that the profession is willing to participate in the development of valid, reliable data on medical practice.

The controversies surrounding health care delivery today make it crucial that the Association collect reliable, up-to-date information on physicians' practices. Therefore, we ask for your assistance. These surveys have been very useful in representing the physician's practice situation. All responses will be handled in the strictest confidence and only aggregate figures will be published.

The success of this survey and, therefore, its usefulness to the individual physician and to the profession depends on your reply. Your cooperation in this important project is greatly appreciated.

Sincerely,

James H Sammons

James H. Sammons, M.D.
Executive Vice President

INSTRUCTIONS

Please answer every question relevant to your practice. If you do not have the specific information, please provide an estimate. A pre-addressed return envelope is provided. Please return this questionnaire at your earliest convenience even if it includes unanswered questions.

A. PRACTICE CHARACTERISTICS

1. Please give the SPECIALTY from which you derived 50% or more of your 1978 MEDICAL income . . . . . ______________

2. How many weeks did you practice in 1978? (EXCLUDE residency, medical meetings, military service, vacations and similar absences from practice.) . . . . . ______ WEEKS.

3. Is your practice organized as a professional corporation? ☐ Yes ☐ No

4. Which of the following best describes the size and type of your main practice arrangement?
   ☐ Solo (Individual, self-employed)

   ☐ Partnership or Group Practice. Please indicate the number of physicians INCLUDING yourself . . . . . ______

   ☐ Other ______________________________
   (Please describe)

5. If you are in a partnership or group practice arrangement, which of the following BEST describes your method of income distribution?
   ☐ Equal distribution ☐ Straight salary ☐ Salary plus share of profit ☐ Fee-for-service (expense sharing)

   ☐ Other ______________________________
   (Please describe)

B. HOURS PRACTICED AND PATIENT VISITS

1. How many TOTAL HOURS did you practice during your most recent COMPLETE WEEK of practice? (EXCLUDE "on-call" hours not actually worked.) . . . . . ______ HOURS

2. How many of these HOURS were spent in providing DIRECT PATIENT CARE or patient-related services? (INCLUDE interpreting X-rays, lab tests, etc. EXCLUDE administrative tasks, meetings, etc.) . . . . . ______ HOURS

3. How many HOURS did you spend in the following activities during your most recent COMPLETE WEEK of practice?
   a. Seeing patients in office . . . . . ______ HOURS
   b. Seeing patients in hospital (inpatient, outpatient, etc.) . . . . . ______ HOURS
   c. In business administration activities (employee supervision, filling out insurance forms, etc.) . . . . . ______ HOURS

4. How many PATIENT VISITS did you have during your most recent COMPLETE WEEK of practice?
   a. At the office . . . . . ______ VISITS
   b. At the hospital . . . . . ______ VISITS
   c. At all other facilities . . . . . ______ VISITS

5. Please give the approximate time that a patient wishing to see you has to wait:
   a. To be scheduled for a routine office visit.
   A New Patient: ______ DAYS An Established Patient: ______ DAYS
   b. To be scheduled for a specific complaint.
   A New Patient ______ DAYS An Established Patient: ______ DAYS
   c. To see you after arriving for a scheduled appointment. ______ MINUTES

6. Please specify the name and location of the hospital to which you MOST FREQUENTLY admit patients:

   ____
   Name of Hospital City State

7. Please estimate the travel time (in minutes) from your office to this hospital . . . . . ______ MINUTES

C. PRACTICE SETTINGS

1. How *important* was each of these issues to your *choice* of solo or group practice?

(Please check one box in each row)

	Very Important	Important	Not Important
a. quality of care delivered to patients	☐	☐	☐
b. personal associations or friendships	☐	☐	☐
c. business side of medical practice	☐	☐	☐
d. predictability of practice schedule	☐	☐	☐
e personal autonomy in delivering care	☐	☐	☐
f practice location	☐	☐	☐
g. earnings potential	☐	☐	☐
h. professional contacts and interactions	☐	☐	☐

2. Overall, which was the *most important* issue? ____________________

3. What types of personnel does your practice currently employ? Indicate in Column (1) the number of full-time equivalent personnel. If you are in a group practice or expense-sharing arrangement, indicate in Column (2) the number of physicians sharing each type of personnel, including yourself. Convert part-time employees to full-time equivalents on the basis of hours worked.

	(1) Number of Full-Time Equivalent Personnel	(2) Number of Physicians Sharing Personnel
a. Registered Nurses or Licensed Practical Nurses	____	____
b. X-ray, Lab and Medical Technicians and Assistants	____	____
c. Secretaries, Receptionists, Clerks, etc.	____	____
d. Other (specify)	____	____

D. PATIENT CHARACTERISTICS AND REIMBURSEMENT

1. Approximately what percentage of your patients would you estimate are:

a. Female? .... ____ %

b. 15 years of age or younger? .... ____ %

c. Have family income of $25,000 or more .... ____ %

2. Please estimate the percentage of your current patients whose principal HEALTH INSURANCE coverage is:

a. Medicare .... ____ %

b. Medicaid .... ____ %

c. Prepayment-Capitation (HMO, IPA, Foundation) .... ____ %

d. Blue Cross/Blue Shield .... ____ %

e. Other insurance plans (Commercial, etc.) .... ____ %

3. What percentage of your USUAL charge for a follow-up office visit is covered when you bill each of the following plans directly?

Medicare ____ % Medicaid ____ % Blue Shield ____ %

4. For what percentage of your patients who are Blue Shield subscribers are you reimbursed on a "usual, customary, and reasonable" (UCR) basis? ______ %

5. For what proportion of your Blue Shield patients are you a participating physician? ______ %

6. For what proportion of your Medicare patients do you accept assignment? ______ %

E. INCOMES, EXPENSES, AND FEES

1. What was your Gross Income from MEDICAL PRACTICE in 1978 to the nearest $1,000? (INCLUDE all income from fees, salaries, retainers, etc. BEFORE expenses and taxes, as well as the value of all fringe benefits paid on your behalf, e.g., Keogh Plan. If in practice with other physicians, give only YOUR share of the practice's gross income.)

   1978 Gross Income $ ______ .000 PROJECTED 1979 Gross Income $ ______ .000

2. What were your total tax-deductible PROFESSIONAL EXPENSES in 1978? (If you shared expenses with other physicians, indicate your share only.)

   1978 Professional Expenses $ ______ .000 PROJECTED 1979 Professional Expenses $ ______ .000

3. What was your 1978 INDIVIDUAL NET INCOME BEFORE TAXES from medical practice?

   1978 Individual Net Income Before Taxes $ ______ .000

   PROJECTED 1979 Individual Net Income Before Taxes $ ______ .000

4. For each of the following procedures, please indicate your CURRENT USUAL FEE: (If you do not have a fee-for-service practice, please check this box ☐ and disregard this question.)

   a. Office visit, NEW patient, brief evaluation, history, examination and/or treatment .... $ ______ .00

   b. Office visit, ESTABLISHED patient, brief examination and/or treatment, same or new illness .... $ ______ .00

   c. Appendectomy .... $ ______ .00

   d. Hospital visit, new or established patient, brief examination, evaluation and/or treatment, same illness .... $ ______ .00

5. What were your total tax-deductible PROFESSIONAL EXPENSES for the following items in 1978? (If you shared expenses, indicate only your share.)

   a. Total non-physician payroll expenses (INCLUDING fringe benefits) .... $ ______ .00

   b. Professional liability (malpractice) insurance .... $ ______ .00

   c. Medical equipment expenses (annual depreciation, leases, rent) .... $ ______ .00

   d. Office expenses (mortgage, rent, utilities, etc.) .... $ ______ .00

   e. All other expenses .... $ ______ .00

6. What is the current average WEEKLY salary per full time employee for the following types of personnel?

   Registered nurse $ ______ .00 Secretary $ ______ .00

The Physician Code numbers printed at right are needed during the survey to relate information from this questionnaire to the biographical and educational characteristics of each respondent.

Please detach your name and address before returning this questionnaire. If you have any questions, please call (312) 751-6487.

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Table 54—Average Net Income from Medical Practice by Specialty and Corporation Status, 1978

Specialty	Total		Status	
			Not Incorporated	Incorporated
	N	Mean	(N=1628)	(N=1579)
			Mean	
Total[a]	3,198	$65,500	$54,400	$77,100
Gen. Practice	647	54,600	49,300	66,100
Int. Medicine	572	63,600	55,100	73,600
Surgery	698	82,700	67,300	91,600
Pediatrics	209	51,100	46,600	57,600
Obstetrics-Gynecology	253	70,200	57,200	77,100
Radiology	140	82,000	72,500	86,300
Psychiatry	260	50,200	45,900	59,800
Anesthesiology	121	74,200	62,100	78,800
			Standard Error	
Total		650	776	970
Gen. Practice		1,115	1,294	1,915
Int. Medicine		1,379	1,696	2,089
Surgery		1,819	2,592	2,347
Pediatrics		1,612	2,137	2,284
Obstetrics-Gynecology		2,161	3,342	2,646
Radiology		2,919	5,320	3,418
Psychiatry		1,371	1,571	2,401
Anesthesiology		2,708	4,369	3,222

[a] Total includes "Other" category.

Source: Thirteenth Periodic Survey of Physicians. March 1979. Center for Health Services Research and Development, American Medical Association.

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